

**U.S. Department of the Interior  
Bureau of Land Management**

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**Craters of the Moon National Monument & Preserve  
Draft Management Plan Amendment  
and Environmental Impact Statement**

**NATIONAL  
CONSERVATION  
LANDS**









# **Craters of the Moon National Monument Draft MMP Amendment and Environmental Impact Statement**

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# Dear Reader Letter

Dear Reader:

Attached for your review and comment is the Craters of the Moon National Monument and Preserve Draft Monument Management Plan Amendment and Environmental Impact Statement (Draft MMP Amendment/EIS) for the Idaho Bureau of Land Management (BLM) Shoshone Field Office. The BLM prepared this document in consultation with cooperating agencies, and in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, the Federal Land Policy and Management Act (FLPMA) of 1976, as amended, implementing regulations, the BLM's Land Use Planning Handbook (H-1601-1), and National Environmental Policy Handbook (H-1790-1), and other applicable law and policy.

The planning area consists of about 753,200 acres of land which includes about 275,100 acres of lands managed by the BLM's Shoshone, Burley, and Upper Snake Field Offices. Based on this analysis, the Craters of the Moon National Monument and Preserve Management Plan (2007 MMP) will be amended and guide livestock grazing management of public lands within the Monument administered by the Shoshone, Burley, and Upper Snake Field Offices and Craters of the Moon National Monument into the future. The Draft MMP Amendment/EIS and supporting information is available on the project web site at: [http://www.blm.gov/id/st/en/prog/nepa\\_register/Craters-plan-amdt\\_2013.html](http://www.blm.gov/id/st/en/prog/nepa_register/Craters-plan-amdt_2013.html)

The BLM encourages the public to provide information and comments pertaining to the analysis presented in the Draft MMP Amendment/EIS. We are particularly interested in feedback concerning the adequacy and accuracy of the proposed alternatives, the analysis of their respective management actions, and any new information that would help the BLM as it develops the plan. In developing the Proposed MMP Amendment/Final EIS, which is the next phase of the planning process, the decision maker may select various management options from each of the alternatives analyzed in the Draft MMP Amendment/EIS for the purpose of creating a management strategy that best meets the needs of the resources and values in this area under the BLM multiple use and sustained yield mandate. As a member of the public, your timely comments on the Draft MMP Amendment/EIS will help formulate the Proposed MMP Amendment/Final EIS. Comments will be accepted for ninety (90) calendar days following the Environmental Protection Agency's (EPA) publication of its Notice of Availability in the Federal Register. The BLM can best utilize your comments and resource information submissions if received within the review period.

Comments may be submitted electronically to: [BLM\\_ID\\_CRMO@blm.gov](mailto:BLM_ID_CRMO@blm.gov). Comments may also be submitted by mail to:

Craters of the Moon National Monument Planning Team  
BLM Shoshone Field Office  
400 West F Street  
Shoshone, ID 83352

To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments in an electronic format.

Your review and comments on the content of this document are critical to the success of this planning effort. If you wish to submit comments on the Draft MMP Amendment/EIS, we request




that you make your comments as specific as possible. Comments will be more helpful if they include suggested changes, sources, or methodologies, and reference to a specific section or page number. Please note, if reviewing the document electronically, page numbers at the bottom of each page are different from the Adobe Reader page number listed at the top of the program window. Please make note of which page numbers you are referencing. Comments containing only opinion or preferences will be considered and included as part of the decision making process, but they will not receive a formal response from the BLM.

Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Copies of the Draft MMP Amendment/EIS have been sent to affected Federal, state, and local government agencies, as well as Tribal governments. Due to the BLM's paper-use reduction initiatives, we encourage the public to review electronic copies of this plan. The Draft MMP Amendment/EIS will be available online and on CD. A limited number of hard copies will be printed and available upon request on a first come, first served basis.

Thank you for your continued interest in the Draft Craters of the Moon National Monument and Preserve Management Plan Amendment and Environmental Impact Statement. We appreciate the information and suggestions you contribute to the planning process. For additional information or clarification regarding this document or the planning process, please contact Lisa Cresswell, MMP Team Lead, at (208) 732-7200.

Sincerely,

A handwritten signature in black ink that reads "Holly Crawford". The signature is written in a cursive, flowing style. The first name "Holly" is written in a larger, more prominent script, and "Crawford" follows in a similar but slightly smaller script. The signature is contained within a thin black rectangular border.

Holly Crawford  
Craters of the Moon Monument Manager  
Bureau of Land Management

# Executive Summary

What is BLM proposing to do in this plan?

The BLM has completed the Draft MMP Amendment/EIS to determine the appropriate management of livestock grazing on BLM-administered lands (public lands) within the Monument (approximately 275,100 acres). This MMP Amendment/EIS analyzes management options for the BLM-managed portions of the Monument that were not previously addressed by the 2007 MMP and will amend that plan. Among the most important decisions the BLM will make through this plan amendment are what lands should be made available for livestock grazing and with what protections for greater sage-grouse (sage-grouse). (For more information, see Chapter 1, *Introduction*).

Why is BLM doing this plan?

In 2008, Western Watersheds Project filed a complaint in the United States District Court for the District of Idaho (Court) alleging the Secretary of the Interior and the BLM violated NEPA and FLPMA when the BLM issued Records of Decision (ROD) on 16 Resource Management Plans (RMP) between 2004 and 2008, including the 2007 MMP. In 2011, the Court found that the planning decision violated NEPA and FLPMA because the underlying EIS supporting the Management Plan was deficient by (1) failing to adequately address the 2004 Nature Conservancy Report [Jurs & Sands, 2004], the 2004 Western Association of Fish and Wildlife Agencies Conservation Assessment, the BLM's own Special Status Species Policy, and the National Sage-Grouse Habitat Conservation Strategy and (2) failing to consider a no-grazing alternative or any alternative that would have reduced grazing levels. In November 2012, the Court ordered the BLM to revise the 2007 MMP in order to address these deficiencies. The BLM proposed to accomplish this by completing a set of plan amendments analyzing no-grazing and reduced-grazing alternatives, in addition to developing measures for sage-grouse conservation within the Monument.

How is this proposed plan amendment different from the 2007 Craters of the Moon National Monument and Preserve MMP?

The 2007 MMP was not vacated by the 2012 Court Order and management direction found in the existing plan will remain in effect. As such, alternatives developed for this planning effort are consistent with the management objectives found in the 2007 MMP.

This document analyzes a range of options for managing livestock grazing while protecting sage-grouse and its habitat, including reduced-grazing and no-grazing alternatives. This document will amend the existing 2007 MMP.

Since the 2007 MMP was signed, the BLM finalized the Greater Sage-Grouse Approved Resource Management Plan Amendment (GRSG ARMPA), which amended the 2007 MMP to address several of the deficiencies identified by the Court with regards to sage-grouse conservation in the Monument. Please refer to Chapter 1, *Introduction* for more details on the relationship of the two Amendments.

What are the major issues and focus of controversy?

The major issues in the Draft MMP Amendment/EIS are decisions on the location and amount of livestock grazing and protection of Monument values, including sage-grouse and their habitat.

The Draft MMP Amendment/EIS examines a range of alternatives for livestock grazing, while also offering appropriate sage-grouse protections.

To understand the current condition, the planning team applied the Habitat Assessment Framework (HAF) methodology in 2012 and 2013 to evaluate current habitat suitability for sage-grouse. Occupied seasonal habitats were mapped using recent telemetry data and current habitat data, which were reviewed by Federal and State biologists.

Data showed that a lack of sagebrush cover resulting from wildfire is primarily responsible for habitats not meeting the seasonal requirements for sage-grouse throughout the Monument (Table 3.5, “Site-Scale Suitability Summary of Occupied Greater Sage-Grouse Habitats on BLM-Administered Lands in the Monument”). Adequate breeding habitat is an indicator of other habitat needs, and a lack of sagebrush was the sole cause of 73% of evaluated sites being unsuitable for breeding habitat, whereas herbaceous components were the sole cause of 3% of sites being unsuitable. Grasses and forbs are sufficient components of the sage-grouse breeding habitat on 89% of all sites evaluated, whereas sagebrush was sufficient in 61%. 16% of sites evaluated were unsuitable for summer habitat, and sagebrush was a cause in 95% of them and herbaceous components were a cause in 43% (38% are a combination of the two). A lack of perennial grass cover and height (19% of sites) and a low availability of forbs (16% of sites) have detracted from the ability of areas to provide for the life-cycle needs of sage-grouse in the planning area, but not nearly to the extent of sagebrush (95% of sites). 67% of BLM-managed Monument lands have burned in the last 15 years. Just over half of which has burned more than twice since 1999. Re-establishing adequate sagebrush cover would substantially increase habitat quality within the Monument for sagebrush obligate species, including Greater sage-grouse.

Noticeable changes in plant community species composition caused by historic grazing (late 1800’s-early 1900’s) are persisting and exacerbated through frequent, sometimes recurrent wildfire. Historic livestock grazing still has measurable effects, but BLM’s current livestock grazing management in the Monument has improved, particularly since the inception of Idaho’s Standards for Rangeland Health in 1997.

The NRCS Ecological Site Descriptions (potential vegetation) were used to estimate the amount of forage present in the Monument, supported by data collected in 2012 and 2013. Estimates range from a minimum of 111,000 AUMs of perennial grass production in low production years to 222,000 AUMs of perennial grass production in high production years. Considering that 46% of the Monument is within reference state and 40% is rangeland seeding, grass production could achieve the high-end potential. The current allocation of 38,187 AUMs is only 34% of the minimum possible production.

What alternatives are being considered by BLM?

The Draft MMP Amendment/EIS contains five alternatives that provide a range of livestock grazing availability and sage-grouse protections. For more information on the alternatives analyzed, see Chapter 2, *Alternatives*. Alternative C is BLM’s preferred alternative.

Alternative A, the no action alternative, would continue the management established in the current ROD for the 2007 MMP. Under this Alternative, 273,900 acres would be available for livestock grazing, with 38,187 animal unit months (AUMs) available.

Alternative B would reduce AUMs allocated for livestock grazing by approximately 75% and close six areas to grazing: Little Park kipuka, the North Pasture of Laidlaw Park Allotment,

Larkspur Park kipuka, the North Pasture of Bowl Crater Allotment, Park Field kipuka, and a portion of the Craters Allotment. This alternative would adjust two allotment boundaries and make 21,000 acres (about 8% of those currently available) unavailable for livestock grazing, for the protection of Monument values.

Alternative C would make 273,600 acres available for livestock grazing and adjust two allotment boundaries, which would set the maximum number of AUMs at 37,792. Where appropriate, livestock grazing could be used as a tool to improve and/or protect wildlife habitat. Guidelines for livestock grazing management would be set based on vegetation and wildlife habitat conditions and needs.

Alternative D would remove livestock grazing from BLM-managed lands within the Monument boundary and adjust two allotment boundaries. All livestock-related developments would be removed and some fences may be required to exclude livestock from the Monument.

Alternative E would reduce AUMs available for livestock grazing to 19,388 AUMs and close Larkspur Park kipuka to grazing. Where appropriate, livestock grazing would be used as a tool to improve and/or protect wildlife habitat. Guidelines for livestock grazing management would be set based on vegetation and wildlife habitat conditions and needs.

How does the preferred alternative compare to the alternatives in the Draft MMP Amendment/EIS?

The Preferred Alternative—Alternative C—is similar to Alternative A, as it makes similar lands available to livestock grazing, but it adjusts the AUMs permitted slightly and includes new direction for grazing management for the benefit of sage-grouse and cultural resources not currently found in Alternative A as amended by the ARMPA. Alternative C also requires analysis of season or timing of use, duration and/or level of use (AUMs), and grazing schedules at grazing permit renewal when livestock management practices are not compatible with meeting or making progress towards Idaho Standards for Rangeland Health. The Preferred Alternative offers opportunities to provide for sustainable livestock grazing while protecting Monument values and sage-grouse habitat. The Preferred Alternative would give land managers the ability to conduct active vegetation restoration projects and the opportunity to use livestock grazing as a tool to attain restoration objectives. For example, the Preferred Alternative would direct grazing for sagebrush recovery and to benefit the diversity of seedings, thereby enhancing the value of sagebrush steppe communities for wildlife such as greater sage-grouse and pygmy rabbits.

While historic grazing practices were a factor contributing to the decline of sage grouse habitat [Jurs and Sands, 2004], grazing management on BLM lands has changed and rangeland health has steadily improved in recent decades. BLM managed lands in the Monument currently must meet or make progress towards meeting Idaho's Standards for Rangeland Health, which include requirements for sage-grouse habitat. The AUM levels are not dramatically reduced in Alternative C because the forage to provide for the full permitted use is currently present provided proper management is followed. For a variety of economic and logistical reasons, as well as current trends and effective cooperation with permittees, it is unlikely permittees would graze to that level. By adjusting the AUM level slightly, land managers retain the flexibility to use livestock grazing as a tool to attain restoration objectives.

Wildfire and the incursion of invasive plants are currently identified as primary threats to sage-grouse habitat on public lands in Idaho [USDI USFWS, 2013], including within the Monument [Jurs and Sands, 2004]). Since the 2007 MMP, wildfires have markedly reduced the amount of key sage grouse habitat to 27% of the habitat in the Monument. The 2007 MMP set



forth a Desired Future Condition (DFC) that sage-grouse restoration habitat R1 and R2 will achieve significant progress toward reclassification as key habitat and restoration projects were planned at that time, but subsequent wildfires reduced much of the key habitat to R1. The restoration DFC was not vacated by the court and is still an important element of Alternative C, although it is not described in detail in this Draft MMP Amendment.

There are major contrasts between Alternatives B, C, D and E. Alternatives B and E would reduce livestock grazing within the Monument, both in acres and in AUMs, while Alternative C would maintain current livestock AUM levels. The emphasis in Alternative B would be on protection of Monument values and biological resources, including habitat values for sage-grouse. Alternative D would eliminate livestock grazing completely, thus failing to meet the DFC set forth in the 2007 MMP to provide sustainable forage for wildlife and livestock.

How long will this plan direct BLM management of Craters of the Moon National Monument and Preserve?

The dynamic nature of public land resources and uses requires that BLM maintain, amend, and when necessary, revise its land use plans. Typically, the life of a land use plan is about 20 years.

What is next?

The BLM will accept public comments on the Draft MMP Amendment/EIS for the next 90 days. Based on public comments received, the agency will prepare a proposed Final Craters of the Moon National Monument and Preserve MMP Amendment/EIS and ROD.

# **Chapter 1. Introduction**

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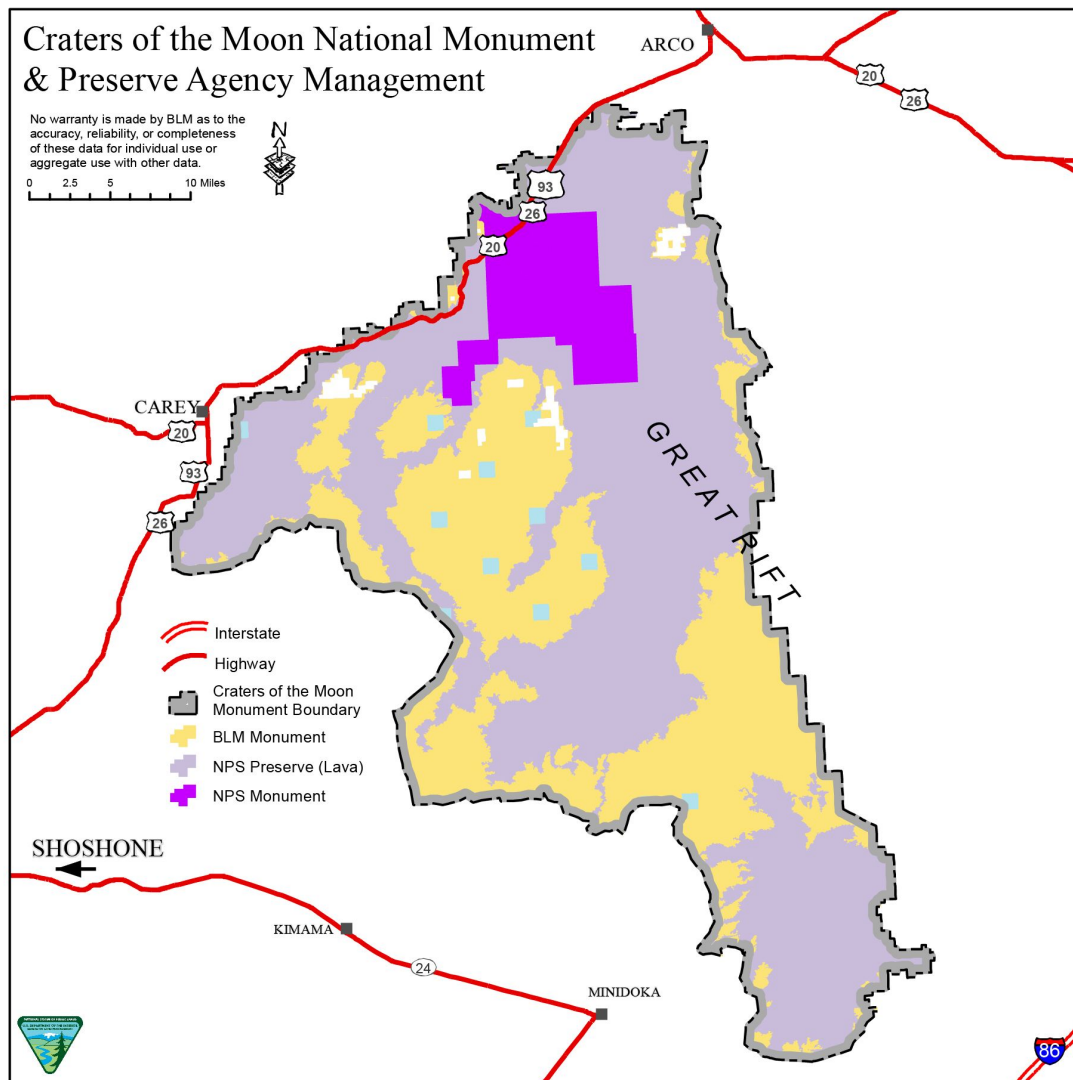
The BLM, Twin Falls District, Shoshone Field Office is preparing a Draft MMP Amendment/EIS addressing livestock grazing management on public lands within the Craters of the Moon National Monument and Preserve (Monument). The 2007 MMP dictates management over National Monument and Preserve lands and resources. This MMP Amendment will guide livestock grazing management on BLM lands within the Monument boundary. Figure 1.1, “Craters of the Moon National Monument and Preserve Agency Management”, shows the administrative breakdown of Monument Lands. Please note that the National Park Service (NPS) Monument and Preserve lands are those administered by NPS, and no grazing is permitted there.

The preparation and adoption of a land use plan, or MMP Amendment in this case, by BLM is a Federal action subject to the National Environmental Policy Act of 1969 (NEPA), as amended. NEPA requires that an EIS be prepared for any Federal action that may significantly affect the human environment. This Draft MMP Amendment/EIS has been prepared in accordance with NEPA, the Council on Environmental Quality’s (CEQ) regulations on the implementation of NEPA (40 CFR 1500-1508), the Resource Management Planning regulations (43 CFR 1610.1 et seq.), the BLM National Environmental Policy Handbook (H-1790-1), and the BLM’s Land Use Planning Handbook (H-1601-1). It analyzes and discloses the direct, indirect, and cumulative impacts of the alternatives considered.

FLPMA requires the BLM to develop, maintain, and revise land use plans to ensure public lands are managed in accordance with the principles of multiple use and sustained yield. FLPMA recognizes the nation’s need for minerals, food, timber, and fiber from public land as well as the importance of maintaining some lands in their natural condition to provide food and habitat for fish and wildlife and opportunities for outdoor recreation.

This MMP Amendment is also subject to the National Historic Preservation Act of 1966 (NHPA), as amended and affords the public the opportunity to comment under Section 106 and the State Protocol Agreement (2014), Stipulation IV.B.

This Draft MMP Amendment/EIS will provide the BLM with a comprehensive framework for administering grazing on public lands and analyzes the future use and management direction of the many natural and cultural resources found in the planning area over the next 20+ years. Within the planning area, BLM manages approximately 275,100 acres of public land surface in Blaine, Butte, Lincoln, Minidoka, and Power counties. Table 1.1, “Land Ownership within the Planning Area”, describes the land surface ownership. The management discussed in this analysis and the decisions to be made based on the MMP Amendment/EIS are within the BLM’s administrative authority and responsibilities.



**Figure 1.1. Craters of the Moon National Monument and Preserve Agency Management**

## 1.1. How to Read this Document

This Draft EIS (1) provides the BLM with sufficient information to make informed, reasoned decisions concerning the planning area, and (2) informs the public about potential management options.

This document is organized to provide the reader with sufficient information to understand (1) the issues to be addressed, (2) the range of management actions available to address issues, (3) the environment in which these issues occur, and (4) the consequences of these actions for the human environment.

- Chapter 1 (Introduction) introduces the planning area and describes the purpose and need for the MMP Amendment. This chapter provides a brief description of the area, scoping and planning issues, DFCs, planning criteria and process, and consistency with other plans.
- Chapter 2 (Alternatives) provides detailed descriptions of the five alternatives and how they were developed. It summarizes environmental consequences by alternative and, as appropriate, their effectiveness in achieving objectives, thus providing a clear basis for choice among alternatives. It also summarizes alternatives that were considered, but dropped from further analysis.
- Chapter 3 (Affected Environment) describes the planning area's existing conditions that would affect or be affected by the management actions being considered. This chapter provides the baseline for analyzing the effects of the alternatives discussed in Chapter 4.
- Chapter 4 (Environmental Consequences) presents a detailed analysis of the consequences of implementing each alternative, including the direct, indirect, and cumulative impacts. Both short- and long-term impacts are discussed.
- Chapter 5 (Consultation and Coordination) provides information on how consultation was conducted, opportunities for public involvement, and how the BLM will respond to comments.

## **1.2. Purpose and Need for the Monument Management Plan Amendment**

The BLM published the MMP in 2007. In 2008, Western Watersheds Project (WWP) filed a complaint in the United States District Court for the District of Idaho (Court) alleging the Secretary of the Interior and the BLM violated NEPA and FLPMA when the BLM issued RODs on 16 RMPs between 2004 and 2008, including the Craters of the Moon MMP. In 2011, after briefing and oral argument, the Court noted that,

“... the MMP/EIS failed to adequately address the best science and the agency's own policies designed to protect that habitat. Moreover, the MMP/EIS failed to discuss alternatives to the status quo regarding grazing.”

Specifically, the Court found that the EIS supporting the 2007 MMP planning decision violated NEPA and FLPMA by (1) failing to consider a no-grazing alternative, (2) failing to consider the recommendations for sage-grouse conservation contained within a 2004 Nature Conservancy Report [Jurs & Sands, 2004] and the 2004 Western Association of Fish and Wildlife Agencies (WAFWA) Conservation Assessment, (3) failing to fully discuss the agency's Special Status Species Policy and National Sage-Grouse Habitat Conservation Strategy, and (4) failing to consider any alternative that would have reduced grazing levels. In November 2012, the Court ordered the BLM to correct these defects. The BLM has done so with two RMP amendment processes supported by EISs.

Prior to beginning the amendment process, a national strategy for sage-grouse management was initiated through issuance of BLM's Instruction Memorandum (IM) No. 2012-044. The IM provided direction to all of the planning efforts across the range of sage-grouse to consider applicable conservation measures when revising or amending RMPs in sage-grouse habitat. The IM also directed BLM to consider the measures set forth in "A Report on National Greater Sage-Grouse Conservation Measures" [NTT Report, 2011]. The national planning strategy

responded to an increasing national concern over the future of the sage-grouse and its habitat, including the U.S. Fish & Wildlife's March 2010 finding that sage-grouse was "warranted but precluded" from listing under the Endangered Species Act (ESA).

As part of the national planning strategy, the BLM developed the GRSG ARMPA which considered sage-grouse conservation measures from the NTT Report. Specifically, the ID/SW MT GRSG ARMPA amended 29 BLM and U.S. Forest Service land use plans for twelve BLM field offices in Idaho and southwestern Montana, including the 2007 Craters of the Moon MMP.

An alternative submitted by Idaho Governor Butch Otter was considered and analyzed in the GRSG ARMPA. The GRSG ARMPA analyzed reduced-grazing and no-grazing alternatives as well. The Craters of the Moon MMP Draft EIS/Amendment also analyzes reduced-grazing and no-grazing alternatives at the local level for the planning area.

At the completion of the Craters of the Moon MMP Amendment, the BLM's goal is to have a land use plan for the Craters of the Moon planning area that includes the following: (1) sage-grouse specific conservation measures that help to alleviate threats to sage-grouse in the Monument and (2) management actions and goals for livestock grazing within the Monument that will guide management of those BLM lands.

In short, the GRSG ARMPA now addresses the Court-identified defects in the 2007 MMP associated with sage-grouse analysis. The Craters of the Moon MMP EIS/Amendment will incorporate its outcomes as stipulated, and address all of the Court's deficiencies, specifically the lack of no-grazing and reduced-grazing alternatives.

The Court Order did not vacate the 2007 MMP, thus management direction regarding livestock grazing and sage-grouse habitat found in the existing plan did not change. In 2015, the GRSG ARMPA amended the Craters of the Moon MMP. The No Action alternative for this Amendment is the 2007 MMP as amended by the GRSG ARMPA. The decisions in the Craters of the Moon MMP that were made through the GRSG ARMPA amendment process will not vary among the alternatives in this Amendment process. The alternatives developed for this Draft MMP EIS/Amendment are consistent and comply with the DFCs found in the GRSG ARMPA and the 2007 MMP, except for Alternative D which is not consistent with the 2007 MMP livestock DFC to "provide livestock forage on a sustainable basis for the life of the plan".

### **1.2.1. Purpose**

The purpose of this MMP Amendment is to update the 2007 MMP's grazing management direction to make it consistent with current laws, regulations, and policies regarding greater sage-grouse habitat conservation. More specifically, its purpose is to consider a range of NEPA- and FLPMA-compliant management options for livestock grazing and greater sage-grouse on BLM-managed lands in the planning area in a manner that maintains the Monument values listed in Proclamation 7373, which expanded the Monument in 2000.

The BLM will analyze a reasonable range of livestock grazing management alternatives consistent with goals for the greater sage-grouse and its habitat outlined in the BLM's current policies, the existing objectives for vegetation and wildlife resource management as identified in the DFCs in the 2007 Craters of the Moon MMP, Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (Standards), protection of Monument Values, as well as other relevant agency policies and guidance.

Proclamation 7373 provides the basis for the protection, conservation, and enjoyment of Monument Values or Objects by declaring “Craters of the Moon holds the most diverse and youngest part of the lava terrain that covers the southern Snake River Plain of Idaho, a broad plain made up of innumerable basalt lava flows during the past 5 million years. The most recent eruptions at the Craters of the Moon took place about 2,100 years ago and were likely witnessed by the Shoshone people, whose legend speaks of a serpent on a mountain who, angered by lightening, coiled around and squeezed the mountain until the rocks crumbled and melted, fire shot from cracks, and liquid rock flowed from the fissures as the mountain exploded.” The original Proclamation, subsequent proclamations and legislation, and the public planning process associated with the 2007 MMP, resulted in the identification of all Monument Values/Objects related to the importance of the Monument. For the purposes of this plan amendment, Monument Values/Objects, as identified through proclamations, legislation, and the public scoping process, to be protected will refer to:

- All volcanic features in the Monument, including, but not limited to kipukas, craters, cones, lava flows, caves, and fissures
- The Great Rift
- Wilderness and Wilderness Study Areas
- Scenic vistas and great open landscapes
- Important habitat for Greater sage-grouse
- Historic and traditional relationships with the land including but not limited to traditional ranching, hunting, and all traditional Native American practices

### **1.2.2. Need**

This MMP Amendment is needed to cure deficiencies identified by the Court in the 2007 MMP/EIS. The Court found that BLM failed to adequately address the current science and agency policies designed to protect sage-grouse habitat, primarily with regard to managing livestock grazing in Monument. The Court also found that BLM failed to consider a range of alternatives related to livestock grazing, including consideration of a no-grazing alternative or any alternative that reduced grazing. As discussed above, the GRSG ARMPA addresses the Court-identified defects associated directly with sage-grouse habitat conservation, while the need for the Craters of the Moon MMP Amendment is to address defects in the range of livestock grazing management alternatives considered. Both amendments utilize and observe the 2004 Nature Conservancy Report [Jurs & Sands, 2004], WAFWA Conservation Assessment, BLM’s Special Status Species Policy, and the National Sage-Grouse Habitat Conservation Strategy.

The MMP Amendment also needs to maintain compliance with FLPMA, the Monument values listed above, the objectives for vegetation and wildlife management identified in the DFCs in the 2007 MMP, Standards, as well as other relevant agency policies and guidance.

## **1.3. Planning Area and Maps**

The planning area is located in south-central Idaho in Blaine, Butte, Lincoln, Minidoka, and Power counties. It extends roughly from the Snake River near Lake Walcott, north to Arco,



Idaho Figure 1.2, “Planning Area Overview Map”. It is a component of the BLM’s National Conservation Lands (NCL) and contains NPS Monument, NPS Preserve, and BLM Monument lands Figure 1.1, “Craters of the Moon National Monument and Preserve Agency Management”.

### **National Conservation Lands**

Craters of the Moon National Monument and Preserve is a component of the BLM’s NCL. The mission of the NCL is to conserve, protect, and restore these nationally significant landscapes that are recognized for their outstanding cultural, ecological, and scientific values.

NCL are part of an active, vibrant landscape where people live, work, and play. They offer exceptional opportunities for recreation, solitude, wildlife viewing, exploring history, scientific research, and a wide range of traditional uses. The NCL sustain these remarkable landscapes of the American spirit for the future.

### **The Monument**

Craters of the Moon National Monument was designated in 1924 by President Coolidge to preserve its ‘lunar’ landscape thought to resemble that of the Moon and was described in the Proclamation as a, “weird and scenic landscape peculiar to itself.” Since 1924, four other presidential proclamations expanded and adjusted the Monument boundary, from roughly 25,000 to 53,000 acres. In November 2000, Presidential Proclamation 7373 expanded the Craters of the Moon National Monument from approximately 50,000 acres to nearly 750,100 acres, where management of exposed lava was transferred from BLM to NPS and BLM-managed lands were included to assure protection for the entire Great Rift volcanic zone, a, “remarkable fissure eruption together with its associated volcanic cones, craters, rifts, lava flows, caves, natural bridges, and other phenomena characteristic of volcanic action which are of unusual scientific value and general interest.” [Proclamation 7373, 2000]

Craters of the Moon is the largest basaltic volcanic field of dominantly Holocene (less than 10,000 years old) lava in the continuous United States. Its central focus is the Great Rift, a 52-mile long crack in the earth's crust. The Great Rift is the source of a remarkably preserved volcanic landscape with an array of exceptional features. Craters, cinder cones, lava tubes, deep cracks, and vast lava fields form a volcanic sea on central Idaho's Snake River Plain. This composite volcanic field was formed by a series of eight separate eruptive episodes separated by series of quiet periods. The now dormant volcanic field is currently in the latest of these quiet periods. Some lava flows traveled distances up to 43 miles from their vents, and some flows diverged around areas of higher ground and rejoined downstream to form isolated islands of older terrain surrounded by new lava. These areas are called ‘kipukas.’

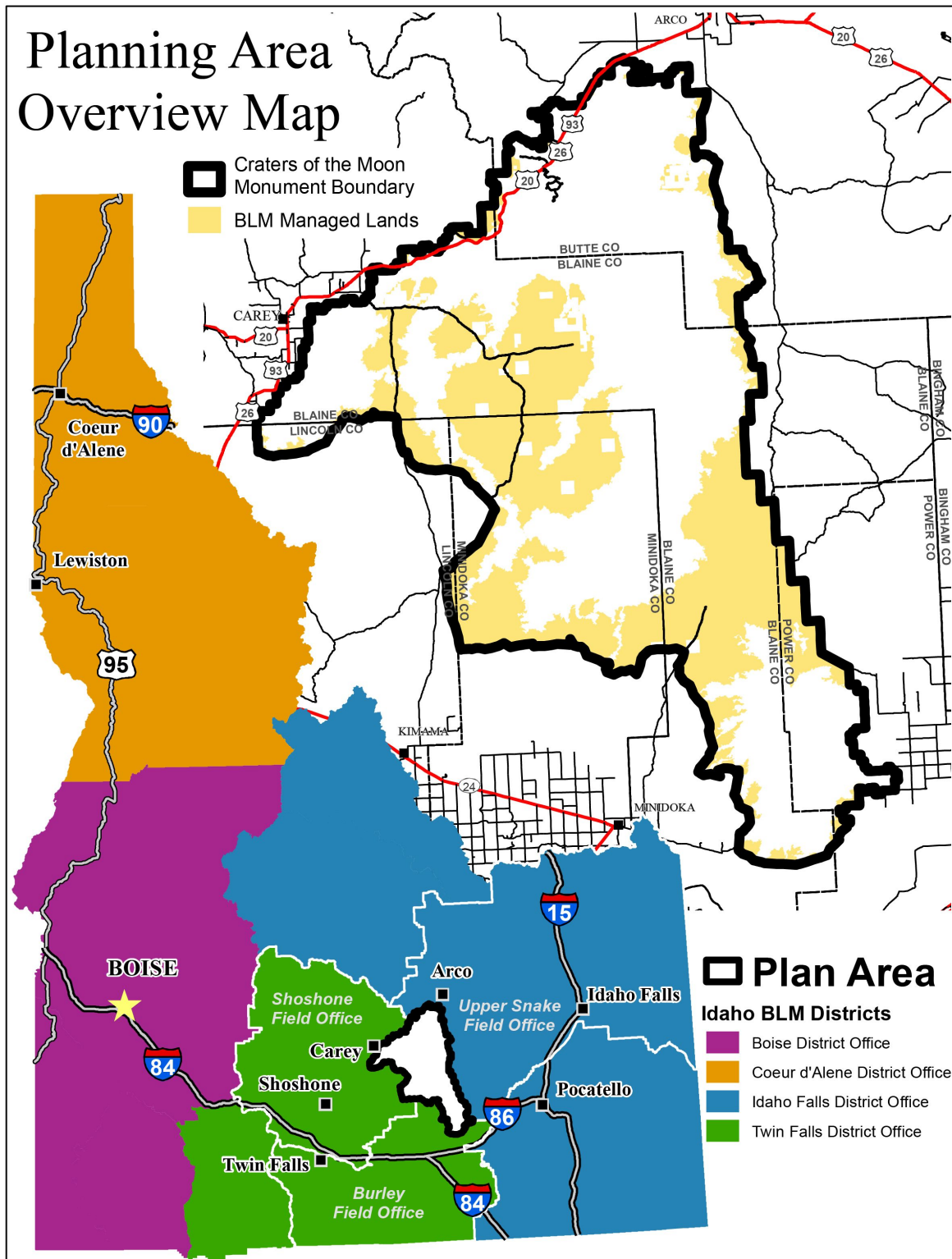
Kipukas can provide a window to vegetative communities of the past that have been unmodified by human influence like most of the remaining Snake River Plain. In many instances, the rugged lava surrounding small pockets of soils has protected kipukas from people, animals, and even exotic plants. As a result, a few of these kipukas represent some of the last nearly pristine and undisturbed vegetation in the Snake River Plain, including relict stands of sagebrush that are essential habitat for the sensitive greater sage-grouse populations. These tracts of vegetation are remarkable benchmarks that aid in the scientific study of changes to vegetative communities from recent human activity as well as the role of natural fire in the sagebrush steppe ecosystem.

Following the 2000 Monument expansion, NPS and the BLM completed a joint MMP to guide all activities in the Monument and Preserve. Because of the different laws and policies

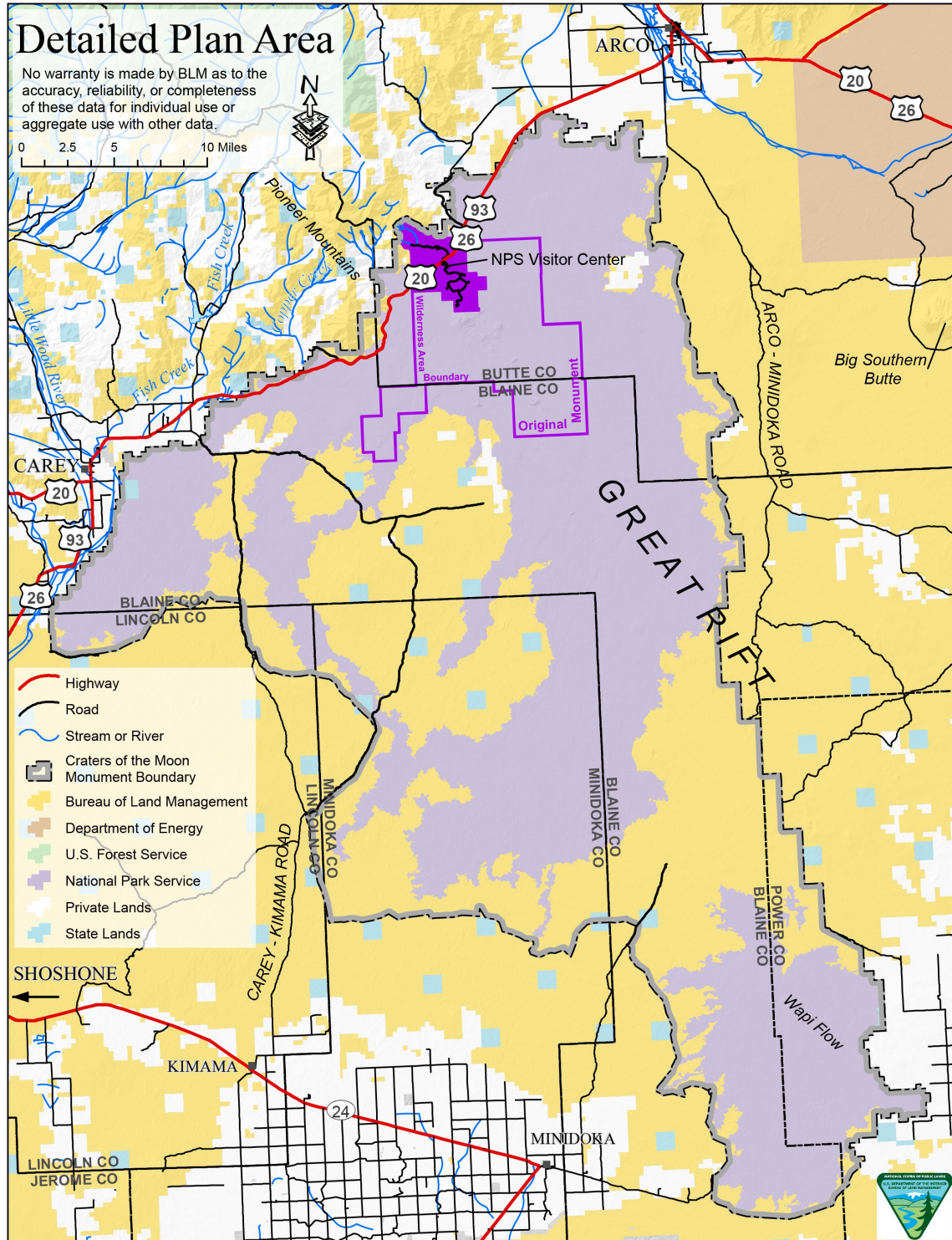
constraining each agency, the process was hybridized to include all of the mandatory portions of each agency's planning process.

Key management objectives were identified in the 2007 Craters of the Moon MMP. Specific management objectives in the 2007 MMP related to this planning effort include:

- Proactively protect and restore sagebrush steppe communities,
- Emphasize protection of vegetation resources in North Laidlaw Park,
- Maintain a road network suitable for aggressive fire management within the Monument, and
- Support a large and proactive integrated weed management program.



**Figure 1.2. Planning Area Overview Map**



**Figure 1.3. Detailed Planning Area**

### 1.3.1. Land Ownership and Administration in the Planning Area

The Monument is the planning area, as it is the unit covered by the 2007 MMP which will be amended on the basis of this MMP Amendment/EIS. The Monument comprises lands managed by the BLM, the NPS, and the State, as well as limited private land. Table 1.1, “Land Ownership within the Planning Area”, provides the breakdown. State and private lands are grazed in conjunction with the adjoining BLM lands throughout the majority of the planning area; however the management actions included in this MMP Amendment/EIS apply only to BLM-managed lands in the planning area.

**Table 1.1. Land Ownership within the Planning Area**

Land Ownership	Acres	Percent
BLM	275,100	37%
NPS	463,300	62%
State	8,200	1%
Private	6,600	1%

#### Craters of the Moon National Monument, Shoshone, Burley, and Upper Snake Field Offices and the Planning Area

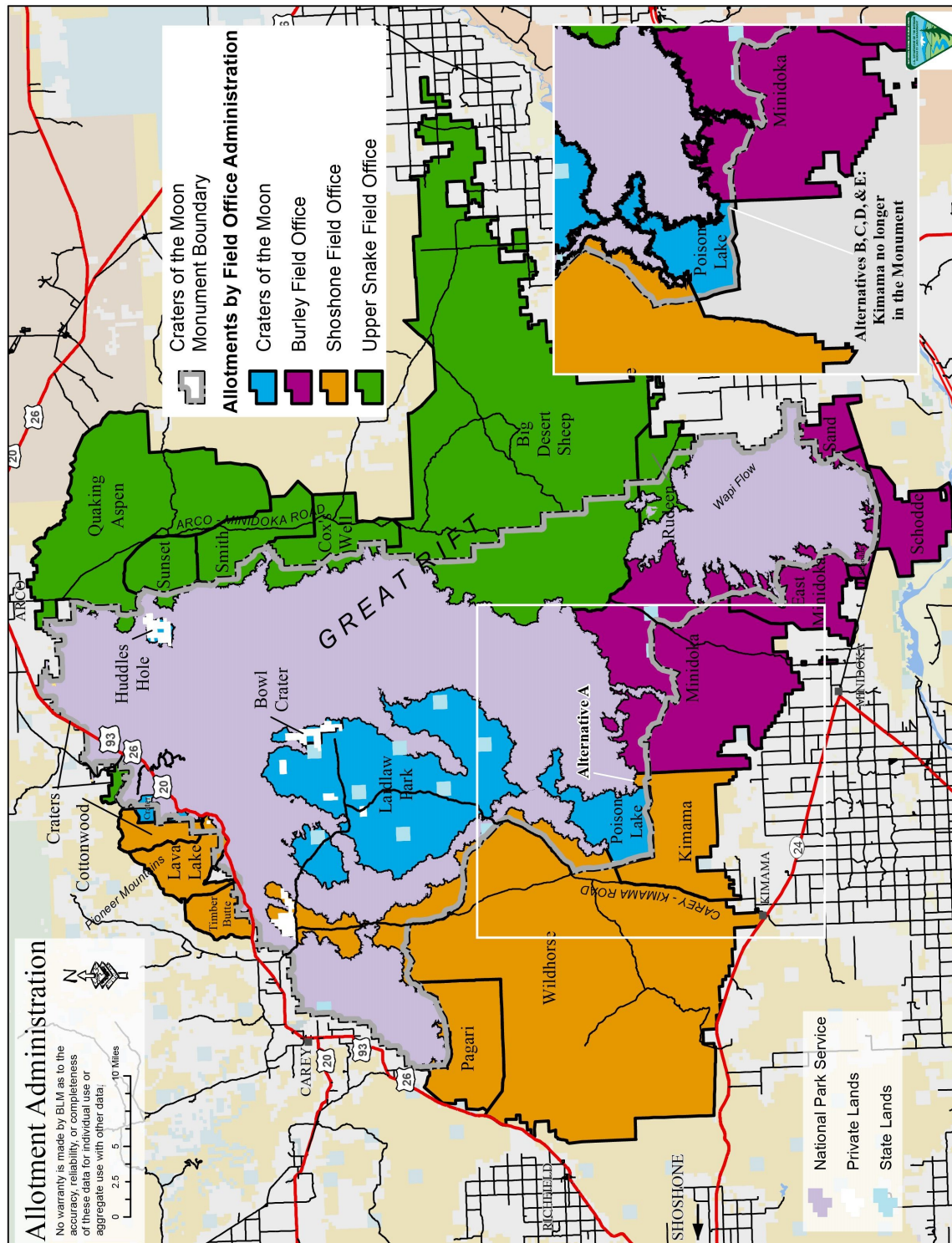
The 2000 Proclamation that designated the current Craters of the Moon National Monument and Preserve boundary incorporated lands from three BLM Field Offices: Shoshone, Burley, and Upper Snake, as well as National Park Service lands. Shoshone and Burley Field Offices lie within the Twin Falls District, while the Upper Snake Field Office is in the Idaho Falls District. Shoshone Field Office was named as the lead BLM office for Monument management, although management of livestock grazing remained with the Field Office that originally managed those allotments.

Of the 275,100 acres managed by BLM, 273,900 are currently available for livestock grazing. Table 1.2, “Planning Area Livestock Grazing Administration” further summarizes the acres of BLM lands that are available to grazing by which Field Office administers them. Figure 1.4, “Allotment Administration” shows the location of these grazing lands and the allotments they comprise by administering field office.

**Table 1.2. Planning Area Livestock Grazing Administration**

Livestock Grazing Administration	BLM Acres	Percent
Craters of the Moon National Monument	110,800	40%
Burley Field Office	53,400	19%
Shoshone Field Office	34,000	13%
Upper Snake Field Office	75,500	28%





### Figure 1.4. Allotment Administration

### **1.3.2. Geographic and Social Setting**

Socioeconomic conditions in these counties have followed roughly the same pattern as the rest of the U.S. since 2008: a long upward trajectory in economic variables such as personal income and employment was interrupted by the 2007-2009 recession. Although growth has resumed, the growth rate has slowed from what it was prior to the onset of the recession. In contrast with many other parts of the U.S. and Idaho, the five-county region has experienced net out-migration. In other words, more residents have moved away from the area than have moved to the area. In spite of this out-flow of residents, total population has increased due to local births.

The Monument plays multiple roles within the socioeconomic structure of the surrounding community. Grazing feeds revenues into the local agricultural economy at multiple levels. The Monument attracts visitors from outside the region, who spend money in local retail and service industry outlets. In addition, Monument employees' salaries and employee spending contribute to the community economy. Payments in Lieu of Taxes (PILT) from the Federal government to the State make an additional contribution to the regional economy.

## **1.4. Scoping**

Scoping is a term used in the CEQ regulations to describe the early and open process for determining issues to be addressed in an EIS. A list of stakeholders and other interested parties is also confirmed and augmented during the scoping process. Scoping involves soliciting input from other stakeholders, including other agencies, organizations, and the general public. It also entails the internal, interdisciplinary review required by NEPA. Agency regulations and standard procedures also play a role in determining the issues and alternatives to be considered in an EIS.

### **1.4.1. The Public Scoping Process**

A Notice of Intent (NOI) informs the public of BLM's intent to initiate the planning process and prepare an EIS. It invites participation from affected and interested agencies, organizations, and the general public in determining the planning criteria, scope, and significant issues to be addressed in the alternatives. The NOI to prepare the Craters of the Moon Plan Amendment was published in the Federal Register on June 28, 2013. This Notice served as the beginning of BLM's formal scoping process. The BLM also uses the NEPA public participation requirements to assist the agency in satisfying the public involvement requirement under Section 106 of the NHPA. Information about historic and cultural resources within the area potentially affected by the MMP Amendment will assist the BLM in identifying and evaluating impacts to such resources in the context of both NEPA and Section 106 of the NHPA.

A project email address and website were created when the NOI was published. The website provided information on the open houses, instructions for submitting scoping comments, a link to the Federal Register NOI, scoping information, and a link to the current management plan for Craters of the Moon National Monument and Preserve.

A press release was sent out on July 22, 2013. Letters to interested parties and permittees were sent on July 23, 2013. A public notice of the scoping meetings was placed in five newspapers and ran in July and August. Newspapers included: The Times-News, The Arco Advertiser, The Post Register, The Idaho Mountain Express, and the Idaho State Journal.

In July and August of 2013, “open house” style scoping meetings were held in Rupert, Carey, Arco and American Falls, Idaho. This format was used to encourage discussions about (1) issues to be addressed in the plan, (2) concerns about the process/planning criteria, and (3) development of the alternatives to be analyzed in the Draft MMP Amendment/EIS. At each meeting, at least three members of the MMP Interdisciplinary (ID) Team, plus the BLM Monument Manager, were available to answer questions. Maps and a presentation were also displayed. Some attendees submitted written comments at that time. Forty individuals participated in these meetings (see Table 1.3, “Scoping Meeting Locations, Dates, and Attendance”).

Cooperating Agency invitations were sent to five counties, five cities, and fourteen State and Federal agencies. Blaine County, Power County, the City of American Falls, and the Idaho State Department of Agriculture requested Cooperating Agency status. Memoranda of Understanding (MOUs) have been signed with these four cooperators.

**Table 1.3. Scoping Meeting Locations, Dates, and Attendance**

Location	Date	Number of Public Attendees
Rupert City Hall	July 30, 2013	1
Carey City Council	August 1, 2013	20
Arco/Butte Business Incubator	August 6, 2013	2
American Falls District Library	August 9, 2013	18

The BLM initiated formal government-to-government consultation with the Shoshone-Paiute Tribe through the Wings and Roots process in August 2013. Government-to-government consultation with the Shoshone-Bannock Tribes was initiated through correspondence in September 2013 and in person on November 2013.

As a result of public scoping efforts, 26 responses were received. Responses were submitted in the format of comment forms provided during public scoping meetings, letters, and e-mails.

For a detailed description of all issues identified during scoping, refer to the 2013 Craters of the Moon National Monument Final Scoping Report. The report is available on the Craters of the Moon MMP Amendment web site at: <https://eplanning.blm.gov>

## **1.4.2. Management Concerns**

In addition to issues identified through public scoping, the scope of this analysis includes pertinent BLM management concerns, as identified in the Land Use Planning Handbook (H-1601-1). Management concerns are generally of a program-specific nature, and while they may not be externally generated or controversial, they deserve consideration in the planning process. The ID team reviewed planning handbook direction as part of their internal, interdisciplinary review of the proposal to identify the issues and concerns to be addressed. This resulted in refinement of broad management concerns to reflect the context of this Draft MMP Amendment/EIS.

## **1.4.3. Issues and Concerns Addressed**

The BLM Land Use Planning Handbook defines a planning issue as, “disputes or controversies about existing and potential resource allocations, levels of resource use, production, and related management practices” [USDI BLM, 2005a]). It is more than just a position statement about current policies. An issue:



- Has a cause and effect relationship with the proposed action or alternatives,
- Is within the scope of the analysis,
- Has not been decided by law, regulation, or previous decision, and
- Is amenable to scientific analysis rather than conjecture.

Issue identification is critical for alternative development for resource management planning. For this Draft MMP Amendment/EIS, a three-step process was used to identify and group the issues. First, the ID Team read all 26 scoping comment letters and identified 316 individual comments. Next, they determined which comments were within the scope for analysis in this amendment because they (1) suggest a reasonable alternative, (2) contribute to developing reasonable alternatives, (3) contribute to developing design features or mitigation measures, (4) suggest credible information or methodologies that should be considered during the analysis, (5) present information that is relevant to the analysis, (6) describe changes to the proposed action along with supporting reasons why the changes should be made, or (7) suggest analysis that is necessary to make a reasoned choice among alternatives. They were grouped into nine broad resource or management-driven concerns.

As noted above, management concerns are generally broad and program specific in nature but were refined through ID team review to develop concerns specific to this analysis.

#### **1.4.3.1. Issues and Concerns Used to Develop Alternatives**

As outlined in section 1.2, Purpose and Need, alternative development in this Draft MMP Amendment/EIS was driven primarily by law and regulation, as well as the 2012 Court Order, rather than by specific environmental issues and concerns. The results of public scoping and internal, interdisciplinary review were used to flesh out the alternatives framed in response to the Court Order.

#### **1.4.3.2. Issues and Concerns Analyzed in Greater Depth**

Based on public scoping and internal, interdisciplinary review of the proposed amendment, the following issues and concerns were identified to guide this analysis.

Monument Values: How will grazing management affect the values for which the Monument was designated?

Soil Resources: How will grazing management changes affect planning area soils in terms of erosion and compaction?

Water Resources: Water is a scarce commodity in the Monument. How will grazing management changes affect riparian areas and playas?

Vegetation Resources: The Monument supports diverse and unique vegetation communities, and the 2007 MMP mandates their protection. Some special status plant species occur within these communities. How will potential changes in livestock grazing management affect these communities and species? How will potential changes in livestock grazing management, specifically those proposed by this amendment, affect fuel loads and fire behavior within the Monument? How will they affect introduction and spread of noxious weeds?

Wildlife and Fish: The Monument's diverse habitats support important wildlife resources, including some special status species. Greater sage-grouse are a serious concern. How will changes in grazing management affect these wildlife species?

Native American Rights and Interests: The Monument is important to certain Native American rights and interests. How will these be affected by changes in grazing management?

Cultural Resources: How will changes in grazing management affect protection of the Monument's cultural resources?

Visual Resources: The 2007 MMP recognized the importance of the Monument's visual resources. How would these resources be affected by changes in grazing management?

Wilderness Study Areas: The Monument includes several Wilderness Study Areas. How will changes in grazing management affect these areas?

Lands with Wilderness Characteristics: How will lands with wilderness characteristics in the Monument be affected by changes in grazing management?

Livestock Grazing: How will the proposed changes affect grazing management flexibility, complexity, forage allocation, availability, and accessibility?

Travel and Transportation: The 2007 MMP recognized the importance of the road network for fire management and control. How will changes in grazing management affect the road network? How will roads that could potentially become unnecessary due to changes to grazing be treated?

Recreation and Visitor Experience: The monument provides unique opportunities for recreation and tourism, and the 2007 MMP supports these activities. How will changes in grazing management affect these opportunities?

Socioeconomic Values: Ranching is an important component of the local socioeconomic setting. How will changes in grazing management affect counties, communities, and permittees?

Climate Change: How could BLM reduce management effects on climate change?

#### **1.4.4. Issues and Concerns Considered but Not Analyzed in Depth**

Several types of comments did not warrant in-depth analysis in the EIS because they did not provide information that was helpful to make a reasoned choice among alternatives. Such comments included, but were not limited to, (1) stating a personal opinion with no supporting rationale, (2) discussing other projects or other project areas, (3) stating a disagreement with BLM policy, (4) discussing decisions that have already been made, or (5) simply stating agreement or opposition to the project. Such issues and concerns raised through public scoping and internal, interdisciplinary review are noted below, followed by the BLM rationale for dropping them from in-depth analysis.

Predator Control: Controlling predatory populations will benefit greater sage-grouse populations.

Rationale: Management and control of predators is outside the jurisdictional authority of BLM.

Scope of the MMP Amendment/EIS: The BLM should look beyond livestock grazing in the Monument and update all components of the 2007 MMP.

**Rationale:** The 2007 MMP process has already addressed and analyzed the other land use allocations and activities within the planning area. The scope of this planning effort is limited to resolving specific defects identified by the Court in 2012 (see Section 1.2, “Purpose and Need for the Monument Management Plan Amendment”) which were not addressed in the 2015 GRSG ARMPA. The BLM will focus on analyzing a range of reasonable alternatives for livestock grazing management, including reduced- and no-grazing alternatives. DFCs, management goals, and management actions that are not directly related to livestock management in the Monument will remain unchanged.

**ACEC Creation:** The BLM should consider an Area of Critical Environmental Concern (ACEC) designation for sage-grouse.

**Rationale:** While the BLM 1613 – Area of Critical Environmental Concern Manual (1988) provides guidance on how the public can nominate ACECs, in this case it’s considered outside the scope of this Draft MMP Amendment/EIS because it does not address the purpose and need (see Section 1.2, “Purpose and Need for the Monument Management Plan Amendment”). The analysis of ACEC nominations took place during the 2007 MMP planning process. The scope of this planning effort is limited to resolving specific defects identified by the Court in 2012, as discussed in Section 1.2, “Purpose and Need for the Monument Management Plan Amendment”. The GRSG ARMPA preparers received an ACEC nomination for the protection of sage-grouse that included part of the Monument. That nomination was considered in the GRSG ARMPA and will not be considered again in this planning effort.

## **1.5. Planning Criteria/Legislative Constraints**

Land use plans are changed through either a plan amendment or a plan revision. The process for conducting plan amendments is basically the same as the land use planning process used in creating RMPs, or in this case the 2007 MMP. Plan amendments (see 43 CFR 1610.5-5) change one or more of the terms, conditions, or decisions of an approved land use plan. These decisions may include those relating to desired outcomes; measures to achieve desired outcomes, including resource restrictions; or land tenure decisions. Plan amendments are most often prompted by the need to:

1. Consider a proposal or action that does not conform to the plan,
2. Implement new or revised policy that changes land use plan decisions, such as an approved conservation agreement between the BLM and the U.S. Fish and Wildlife Service (USFWS),
3. Respond to new, intensified, or changed uses on public land, and/or
4. Consider significant new information from resource assessments, monitoring, or scientific studies that change land use plan decisions.

The BLM regulations set out in the Code of Federal Regulations 43 CFR 1600 and the NEPA process detailed in the CEQ regulations in 40 CFR 1500 guide preparation of plan amendments and associated environmental review.

The regulations ensure that plan amendments are tailored to the identified issues and that unnecessary data collection and analyses are avoided. Planning criteria are based primarily on standards prescribed by applicable laws, regulations, and agency guidance, and consultation with Native American Tribes. They are also based on consultation and coordination with public, other

Federal, State, and local agencies and government entities. Planning criteria serves to keep analysis of information pertinent to the planning area.

Below are the planning criteria and laws, regulations, and policies that form the basis for these criteria and are relevant to each of the resource topics discussed in this Draft MMP Amendment/EIS. This process will:

- Comply with NEPA, FLPMA, NHPA, the Idaho State Protocol Agreement with SHPO (2014), Presidential Proclamation 7373, and all other applicable laws, regulations, and policies;
- Comply with the Court's November 2012 order;
- Consider reasonable alternatives in accordance with regulations at 43 CFR part 1610 and 40 CFR part 1500;
- Only apply to public lands and the mineral estate managed by the BLM in Craters of the Moon;
- Follow the BLM Land Use Planning Handbook H-1601-1 and the BLM NEPA Handbook H-1790-1 where appropriate;
- Comply with all applicable climate change policy and direction, including Secretarial Order #3289, Amendment 1;
- Comply with guidance found in the BLM Manual 6100 - National Landscape Conservation Systems;
- Comply with guidance found in the BLM Manual 6220 - National Monuments, National Conservation Areas, and Similar Designations;
- Comply with guidance found in the BLM Manual 6840 - Special Status Species Management and other policies related to Special Status Species;
- Comply with guidance found in the BLM Manual 6310 - Conducting Wilderness Characteristics Inventory on BLM Lands;
- Comply with guidance found in the BLM Manual 6320 - Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process;
- Comply with guidance found in the BLM Manual 6330 - Management of Wilderness Study Areas;
- Comply with guidance found in the BLM Manual 6280 - Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation;
- Include broad-based public participation;
- Include coordination with State, local, and Tribal governments to ensure that BLM considers provisions of pertinent plans; seeks to resolve any inconsistencies among State, local, and Tribal plans; and provides ample opportunities for State, local, and Tribal governments to comment on the development of the Plan Amendment;

- Rely on available inventories of the lands and resources as well as data gathered during the planning process, including, but not limited to, Habitat Assessment Framework data collected in 2012 and 2013;
- Follow requirements to address greater sage-grouse habitat and conservation as outlined in the National Sage-Grouse Habitat Conservation Strategy and the subsequent GRSG ARMPA;
- Consider actions that will ensure BLM lands in Craters of the Moon meet or make significant progress toward meeting Idaho's Standards;
- Use Geographic Information Systems (GIS) and incorporate geospatial data to the extent practicable and Federal Geographic Data Committee standards and other applicable BLM data standards will be followed;
- Incorporate and observe the principles of multiple use and sustained yield;
- Involve consultation with Native American tribal governments;
- Recognize valid existing rights; and
- Use analysis in the 2007 Craters of the Moon Final EIS to the extent possible and practicable.

## **1.6. Planning Process**

The process for the development, approval, maintenance, and amendment or revision of RMPs, in the case of the 2007 MMP, is initiated under Section 202(f) of FLPMA and Section 202(c) of NEPA. When developing a land use plan, BLM uses a multi-step process, some of which may happen concurrently. Where more detailed management direction is required, BLM will prepare and analyze activity plans after the MMP Amendment's completion.

The steps in this process are:

- **Issues Identification.** The BLM identifies issues and concerns through the scoping process, which includes the public, State and local governments, other Federal agencies, and internal, interdisciplinary review. Issues are also identified through consultation with Native American tribes.
- **Criteria Development.** Planning criteria are drafted to ensure decisions are made to address issues pertinent to the planning effort. They are derived from a variety of sources, including applicable laws and regulations, existing management plans, other agencies' programs, tribal consultation, and public scoping.
- **Data and Information Collection.** Data and information on the natural and cultural resources in the planning area are collected based on the planning criteria and issues developed during scoping.
- **Analysis of the Management Situation.** Current natural and cultural resource management practices are assessed to identify issues and potential opportunities in the planning area.
- **Alternatives Formulation.** A reasonable range of management alternatives are developed that address issues identified during scoping and meet the purpose and need.

- **Alternatives Assessment.** The effects of each alternative are analyzed, including the No Action Alternative.
- **Preferred Alternative Selection.** The alternative that best resolves planning issues is identified as the Preferred Alternative.
- **Management Plan Selection.** First, the Draft MMP Amendment/EIS is made available for public review for at least 90 days. After comments have been received and analyzed, the document is modified as necessary. The Final EIS and Proposed MMP Amendment are then published and made available for a 30-day protest period concurrent with a 60-day Governor's consistency review. Land use plan decisions are subject to protest in accordance with planning guidance, and any protest would be resolved by the National BLM Director. If the Idaho BLM Director approves a Final MMP Amendment, then a Record of Decision would be signed by the Director to approve it.
- **Implementation and Monitoring.** The management measures outlined in the approved MMP amendment would be implemented on the ground, and future monitoring conducted to test their effectiveness.

### **1.6.1. Relationship to BLM Policies, Plans, and Programs**

According to FLPMA (Section 209 [9]), "...the Secretary shall, to the extent he finds practical, keep apprised of State, local, and tribal land use plans; assure that consideration is given to those State, local, and tribal plans that are germane in the development of land use plans for public lands; assist in resolving, to the extent practical, inconsistencies between Federal and non-Federal government plans, and shall provide for meaningful public involvement of State and local government officials, both elected and appointed, in the development of land use programs, land use regulations, and land use decisions for public lands, including early public notice of proposed decisions which may have a significant impact on non-Federal lands."

If these entities do not have officially approved or adopted resource-related plans, then RMPs and their amendments must, to the extent practical, be consistent with those entities' officially approved and adopted resource-related policies and programs. This consistency will be accomplished so long as BLM RMPs and amendments incorporate the policies, programs, and provisions of public land laws and regulations.

As previously described, this MMP Amendment/EIS will amend the existing 2007 MMP. The 2007 MMP covers a broad area and addresses a wide range of programs, concerns, and resources. It must, therefore, function at a general level. Decisions still valid in the 2007 MMP have been carried forward.

The BLM is required to manage lands in accordance with the Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration [43 CFR 4180]. These Fundamentals are minimum standards for watersheds, ecological processes, water quality, and wildlife habitat. They also dictate that if it is determined that livestock grazing management needs to be changed to meet the Fundamentals of Rangeland Health that it must be done within one year of the determination. Each state has implemented its own specific Standards related to these fundamentals. Idaho's Standards and Guidelines are provided in Appendix H.

The more specific actions required to attain the goals and DFCs defined in the 2007 Plan and carried forward in this EIS are accomplished through monitoring and implementation

plans. These plans apply to specific program areas, projects, or operational and development strategies for specific areas of the planning area. Because planning is an ongoing and continuous process, this MMP Amendment must be viewed as a dynamic document. Future, site-specific implementation plans would use the goals and DFCs defined in the 2007 MMP as their starting point. Implementation plans for actions with potential environmental effects would require formal alternatives analysis in compliance with NEPA and related legislation. All such documents would be prepared with the appropriate level of public input.

### **1.6.2. Data Summary**

The interdisciplinary planning team used the most accurate and current data available when analyzing the impacts of alternatives, so it was essential that data was from reliable and reputable scientific sources. In addition to the BLM, Federal agencies such as the U.S. Geological Survey, USFWS, NPS, and Department of Energy, and State of Idaho agencies, including Fish and Game, Department of Lands, Office of Species Conservation, Department of Commerce, and Department of Agriculture, have provided high-quality GIS data and tabular data that was used in the analysis.

Data collection efforts throughout 2012 and 2013 included Habitat Assessment Framework data collection for allotments within the Monument. Data were collected at nearly 400 sites, and the information has been used to determine seasonal greater sage-grouse habitat suitability within the Monument. In addition, a number of telemetry studies have been initiated in the Twin Falls District over the last several years. Data collected from those studies regarding the movement of sage-grouse in the vicinity of and within the Monument will be used in this Plan Amendment/EIS.

New and existing resource information in the Shoshone Field Office, including existing GIS thematic maps (i.e., fire history, range improvements, vegetation treatments, land status, cultural resources, etc.), monitoring data, and grazing files, was used in formulating alternatives and in the impact analysis.

The ID team has reviewed, updated, and evaluated its data collection and has no additional data needs. They have compiled the data and put it into a digital format for use during the planning process and to develop resource maps for the MMP Amendment/EIS.

Pre-existing digital data has been updated to the same standards required for new data where practical. The process of reviewing and updating data is important to the adequacy of the planning process, as the data is needed to quantify resources, create updated maps, and analyze information during alternative formulation. New data generated as part of the MMP Amendment/EIS process will meet applicable established standards and will be available to the public upon request at the completion of the project.

Metadata must be created and appropriately maintained for GIS data to be used in review. Metadata is information about data and/or geospatial services, such as content, source, vintage, spatial scale, accuracy, projection, responsible party, contact information, method of collection, and other descriptions. Reliable metadata development, structured in a standardized manner, is essential to ensuring that data are used appropriately and any resulting analysis is creditable.

The ID Team did not receive any new data from sources outside of the BLM and Idaho Department of Fish and Game during scoping.

### **1.6.3. Collaboration**

The BLM approaches planning based on collaboration, in which interested groups and people, often with varied or opposing interests, work together to seek solutions for managing BLM lands. Collaboration mandates methods, not outcomes; and does not imply that parties will achieve consensus. Collaboration implies that tribal, State, and local governments, other Federal agencies, and the public will be involved well before the planning process is underway, rather than only at specific points stipulated by regulation and policy. Cooperating local, State, and Federal agencies have been a part of the MMP Amendment effort to the fullest extent possible. During plan implementation, BLM will continue partnerships with those entities to select high priority projects and resolve emerging issues.

#### **1.6.3.1. Intergovernmental, Interagency, and Tribal Relationships**

Section 202(c)(9) of FLPMA requires BLM to provide for public involvement of other Federal agencies and State and local government officials in developing land use decisions for public lands, including early public notice of proposed decisions that may have a significant effect on lands other than BLM. It also requires that the BLM, to the extent practical, keeps itself informed of other Federal, State, and local plans; assures that consideration is given to those plans germane to the development of BLM land use plan decisions; and assists in resolving inconsistencies between Federal and non-Federal plans, if possible.

The CEQ regulations require an early and open process for identifying significant issues related to a proposed action and obtaining input from the affected public prior to making a decision that could significantly affect the environment. These regulations specify public involvement at various junctures in the development of an EIS. The BLM designed an iterative review process in order to capture issues from numerous public sources and to satisfy CEQ and FLPMA requirements. These reviews consisted of:

- ID Team product development and internal agency review;
- Formal government-to-government consultation with Native American Tribes;
- Review from the Resource Advisory Council (RAC) and Cooperating Agencies;
- Review from Federal, State, and local agencies;
- Review and comment from the general public; and
- ID Team revisions based on this feedback.

#### **1.6.3.2. Cooperating Agencies**

The CEQ defines a cooperating agency as any agency that has jurisdiction, by law or special expertise, with respect to any environmental impact involved in a proposal under the purview of NEPA [40 CFR 1501.6]. Any Federal, State, or local government authority with such qualifications may become a cooperating agency by agreement with the lead agency. Agencies cooperating formally for this plan include the Idaho State Department of Agriculture, Blaine County, Power County, and the City of American Falls.



### **1.6.3.3. Tribes**

Consultation and participation in the planning process by the Shoshone-Bannock and Shoshone-Paiute Tribes began with publication of the Federal Register NOI. Throughout the development of this Draft MMP Amendment/EIS, the Tribes have played an active role. Their contributions will result in an amendment to the 2007 MMP that provides for better, more responsive land stewardship.

Consultation with the Shoshone-Paiute Tribes is conducted through the Wings and Roots Native American Campfire, an established government-to-government consultation process. Plans for the Draft MMP Amendment/EIS were first presented to the Tribes at a Wings and Roots meeting in August 2013. The Shoshone-Paiute Tribe has indicated that they are interested in any action that would result in ground disturbances or impacts to sage-grouse. Government-to-government consultation with the Shoshone-Bannock Tribes was initiated through correspondence in September 2013 and in person with the tribal Environmental Staff on November 13, 2013. No formal comments have been received to-date from the Shoshone-Bannock Tribe, but they did informally indicate they were most concerned with management actions that might affect tribal access, native plants, and sagebrush obligates. The BLM will continue to collaborate with the Tribes during the ongoing planning process.

### **1.6.3.4. Other Federal Agencies**

Other Federal agencies contributed to the planning process through comments and cooperation throughout the planning process. We have received written comments from the EPA and NPS and have been in contact with USFWS.

### **1.6.3.5. Other Stakeholder Relationships**

The Twin Falls RAC is a 15-member advisory panel which provides advice and recommendation to the BLM on resources and land management issues. Membership includes a cross section of Idahoans representing energy, tourism and commercial recreation, environmental, and archaeological or historic interests, as well as elected officials, a tribal representative, and the public-at-large. Council members are selected for their ability to provide informed, objective advice on a broad array of public-land issues, and their commitment to collaboration in seeking solutions to those issues. RAC members are updated and coordinated with throughout the planning process.

WWP submitted three comment letters (two dated August 21, 2013 and one dated August 23, 2013) during scoping that suggested a number of issues and concerns they felt should be addressed in the MMP Amendment. They also met with BLM representatives on July 1, 2014, to discuss the alternatives the ID Team developed. They have been active in the initial stages of the planning process and will continue to be involved throughout the process.

## **1.7. Related Plans**

In addition to the Federal mandates and guidelines mentioned above, the planning team considered a number of existing management plans, programmatic documents, and implementation plans in the preparation of this Draft MMP Amendment and EIS. The MMP Amendment will strive

for consistency with plans and their revisions pertaining to lands included in and surrounding the planning area, including, but not limited to, the following:

- County comprehensive plans for Blaine, Butte, Lincoln, Minidoka, and Power counties
- State agency plans and comprehensive wildlife conservation strategies
  - Idaho Comprehensive Wildlife Conservation Strategy, 2005
  - Idaho State Water Plan, 1996
  - Idaho Transportation Plan, 2004
  - Working for Recreation: The 2007-2010 IDPR Strategic Plan
  - Idaho Statewide Comprehensive Outdoor Recreation and Tourism Plan (SCORP), 2007-2010
  - Conservation Plan for the Greater Sage-Grouse in Idaho, 2006
- Federal agency plans
  - Craters of the Moon National Monument and Preserve MMP, 2007
  - Craters of the Moon National Monument and Preserve Comprehensive Travel Management Plan, 2009
  - Idaho and Southwest Montana Sub-regional Greater Sage-Grouse Land Use Plan Amendment and EIS/ROD, 2015

The BLM used applicable information from the land use plans and programmatic NEPA documents to develop the management actions in Chapter 2.

**The Approved Resource Management Plan Amendments for the Great Basin Region, including the Greater Sage-Grouse Sub-Regions of Idaho and Southwest Montana, Nevada and Northeastern California, Oregon, and Utah**

In response to a 2010 determination by the US Fish and Wildlife Service (USFWS) that the listing of the Greater sage-grouse (GRSG) under the ESA was “warranted, but precluded” by other priorities, the BLM, in coordination with the US Forest Service, developed a landscape-level management strategy, based on the best available science, that was targeted, multi-tiered, coordinated, and collaborative. This strategy offers the highest level of protection for sage-grouse in the most important habitat areas. It addresses the specific threats identified in the 2010 USFWS “warranted, but precluded” decision and the USFWS 2013 Conservation Objectives Team report.

The ROD and approved RMP Amendments are for the Great Basin Region Greater Sage-Grouse Sub-Regions of Idaho and Southwestern Montana, Nevada and Northeastern California, Oregon, and Utah. The Craters of the Moon planning areas falls within the Sub-regional Idaho and Southwestern Montana Approved Amendment area. The Amendments include habitat management direction that avoids and minimizes additional disturbance in sage-grouse habitat management areas. Moreover, they target restoration of and improvements to the most important areas of habitat. Management under the approved Amendments is directed through land use allocations that apply to sage-grouse habitat. These allocations accomplish the following:

- Eliminate most new surface disturbance in the most highly valued sagebrush ecosystem areas identified as Sagebrush Focal Areas
- Avoid or limit new surface disturbance in Priority Habitat Management Areas (PHMA) and Important Habitat Management Areas (IHMA), of which Sagebrush Focal Areas are a subset
- Minimize surface disturbance in General Habitat Management Areas (GHMA)

In addition to protective land use allocations in habitat management areas, the Amendments include a suite of management actions, such as establishing disturbance limits, sage-grouse habitat objectives, mitigation requirements, monitoring protocols, and adaptive management triggers and responses. They also include other conservation measures that apply throughout designated habitat management areas.

The cumulative effect of these measures is to conserve, enhance, and restore sage-grouse habitat across the species' remaining range in the Great Basin Region and to provide greater certainty that BLM land use decisions in sage-grouse habitat across the species' remaining range in the Great Basin Region can lead to conservation of the sage-grouse and other sagebrush-steppe associated species in the region.

The scope of the Craters of the Moon Draft MMP Amendment/EIS is more narrow than that of the broader GRSG ARMPA. Specifically, the Craters of the Moon Draft MMP Amendment is focused on livestock grazing management decisions within the Monument. While the two planning efforts overlap to a limited extent, they focus on separate and distinct planning decisions to be made at different geographic scales. The GRSG ARMPA broadly addresses livestock grazing best management practices, sets a prioritization scheme whereby grazing permits will be renewed to incorporate GRSG protections, and provides for sage-grouse conservation across Idaho and southwestern Montana. The Craters of the Moon Draft MMP Amendment/EIS specifically considers the allocation of AUMs within the Monument and the availability of Monument lands for grazing.

## **1.8. Overall Vision**

### **1.8.1. Desired Future Conditions**

DFCs or goals are the primary focal points for implementing the MMP, and should reflect the values of the management agency and general public by expressing a desired condition for the area's natural and cultural resources in the foreseeable future. DFCs are very broad statements used to describe the most desirable future condition of resources and/or land uses within the planning area. DFCs aid BLM in identifying actions that will most effectively address unsatisfactory resource conditions, as required by laws and regulations, national policy (e.g., BLM Strategic Plan Goals), State Director guidance, and resource or social considerations.

The listed DFCs do not describe specific actions needed to attain those conditions, but rather are the future vision for the Monument used to develop a course of action. They resulted from a collaborative process involving the ID Team, and include concepts from existing planning document decisions. DFCs were also developed through consultation with Native American Tribes. The following DFCs were developed during the original 2007 planning process from issues or concerns raised by the public and the ID Team during scoping. Addressing these 2007 MMP DFCs remains an objective of this MMP Amendment/EIS. The Court Order did not vacate

the 2007 MMP; management direction regarding livestock grazing and sage-grouse habitat found in the existing plan will remain in effect and is now amended by the GRSG ARMPA. Where there may be conflicts, the DFCs of the GRSG ARMPA take precedence over the 2007 MMP DFCs (Appendix C). The pertinent 2007 MMP DFCs for this planning effort are as follows. A complete list of the 2007 MMP DFCs is contained in Appendix B.

#### **1.8.1.1. Soil and Water Resources**

Soils are stable and functional. The amount of bare mineral soil and cover of perennial vegetation, litter, and biological soil crust are within 10% of that expected for the ecological site.

Riparian areas and wetlands within the planning area are maintained, restored, or enhanced so that they provide diverse and healthy habitat and water quality conditions for riparian- and wetland-obligates and other wildlife species.

#### **1.8.1.2. Vegetation Resources**

The high ecological condition of the vegetation of North Laidlaw Park and Bowl Crater is maintained.

There is no net loss, and preferably a net gain, of sagebrush steppe communities over the life of the plan.

Native plant communities sustain biodiversity and provide habitat for native wildlife.

Woodland communities are maintained as healthy mixed-age communities within their natural range and distribution.

Natural ecological processes are the dominant factor in determining the composition and distribution of plant communities in the Preserve and Wilderness areas.

Continuity of habitat for special status species and general wildlife is emphasized.

Preventing or limiting the spread of noxious weeds using integrated weed management perpetuates the natural condition and biodiversity of the planning area.

The areas dominated by invasive annual species are minimized.

Kipukas in the Pristine Zone (Figure 2.3, “Craters of the Moon National Monument and Preserve Management Zones”) are free of noxious weeds.

Sustainable forage is available for livestock and wildlife.

All plant communities are in or making progress toward Fire Condition Class 1.

#### **1.8.1.3. Fish and Wildlife**

Habitat within the planning area supports a diverse range of native wildlife species and gives the public high-quality opportunities for wildlife-based recreation.

Habitat for migratory birds, including forage, water, cover, structure, and security is available within the Monument to support healthy populations of resident and migrant species.

Sage-grouse restoration habitat (R1 & R2) will achieve significant progress toward reclassification as Key habitat. (See Section 3.2.4, “Wildlife and Fish, Including Special Status Species”.)

High-quality habitats for sagebrush-obligate species are provided.

Species composition in Key sage-grouse habitat will reflect site potential.

The DFCs of the GRSG ARMPA apply to the Monument as well. Where there may be conflicts, the DFCs of the GRSG ARMPA take precedence over the 2007 MMP DFCs.

#### **1.8.1.4. Wildfire Ecology and Fuels Management**

Fire is allowed to function as a natural process in the Wilderness and Preserve.

#### **1.8.1.5. Native American Rights and Interests**

Traditional cultural properties of Native American tribes and access to those properties are preserved within the Monument for the use and benefit of current and future tribal members.

For Native American tribes that have ties to this land as part of their ancestral homeland, the Monument holds meaning and value and is a place where treaty rights and religious/sacred traditions may be practiced in a manner supportive of the purpose of the Monument.

Agencies and tribes maintain a government-to-government relationship, and the agencies routinely consult on matters involving the treaty interests and/or rights of tribes.

Tribal oral history will be considered and incorporated into interpretive materials, as well as resource management.

#### **1.8.1.6. Cultural Resources**

The extent and condition of cultural resources and traditional cultural properties are documented and adverse effects are avoided.

The agencies maintain a single, consolidated cultural resource database.

Archaeological resources either listed on or eligible to be listed on the National Register of Historic Places are protected in an undisturbed condition unless it is determined through appropriate consultation with the State Historic Preservation Office (SHPO) that disturbance or natural deterioration is unavoidable.

The qualities that contribute to the eligibility for listing or listing of prehistoric/historic structures and historic trails on the National Register are preserved and protected in accordance with the Secretary of the Interior’s Standards, unless it is determined through appropriate consultation that disturbance or natural deterioration is unavoidable.

#### **1.8.1.7. Visual Resources**

Existing opportunities to experience solitude, dark night sky, and views of landscapes remain substantially free of human intrusions.

A primitive and natural visual setting is retained.

The visual integrity of Goodale's Cutoff historic trail corridor remains protected.

Management activities meet or exceed adopted Visual Resource Management (VRM) classes.

#### **1.8.1.8. Wilderness and Wilderness Study Areas**

Natural conditions in Wilderness and Wilderness Study Areas (WSAs), including air quality, dark night skies, and natural quiet, are substantially free of human influences.

Air quality degradation and adverse impacts to air quality related values, particularly visibility, within the Class I air quality area of the Craters of the Moon Wilderness Area do not occur.

Future generations enjoy the enduring wilderness resources of the Craters of the Moon Wilderness, including its conservation, scientific, cultural, educational, and recreational benefits.

WSAs retain the wilderness values identified in the wilderness inventory and study process.

#### **1.8.1.9. Livestock Grazing**

Sustainable rangeland ecosystems are healthy; public rangelands are maintained or restored to meet Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management [USDI BLM, 1997].

Livestock forage is provided on a sustainable basis for the life of the plan, consistent with other resource objectives and with public land use allocations.

Livestock developments are consistent with DFCs for natural, cultural, and visual resources.

#### **1.8.1.10. Transportation and Travel Management**

There is a net decrease of road mileage within the Monument.

The road system in the planning area provides access for visitors, permittees, non-Federal landowners, and administrative needs while protecting those resources and values the Monument was established to preserve.

The agencies coordinate road management inside and outside of the Monument in a cooperative fashion with local government agencies so that the transportation system is managed in a comprehensive, logical manner.

The agencies also work cooperatively with local government agencies to provide appropriate access to the Monument and private lands within the Monument.

The road system within the planning area supports efficient response time for fire suppression activities.

Most management direction related to travel and access is covered by management zone allocation.

### **1.8.1.11. Recreation and Visitor Experience**

The Monument builds and maintains positive relationships with visitor user groups and education organizations.

The public perceives the Monument as a single entity, and its management as a model of public service.

The public understands and appreciates the area's natural and cultural resources, including its history and uses.

The public has access to Monument information and learning opportunities, both on- and off-site.

Information/orientation materials such as travel maps, safety bulletins, resource information, and recreation information are available.

Visitors are offered a variety of interpretive media within the Frontcountry Zone.

### **1.8.1.12. Social and Economic Conditions**

Gateway and other nearby communities benefit economically and socially from the presence of the Monument.

## **Chapter 2. Alternatives**



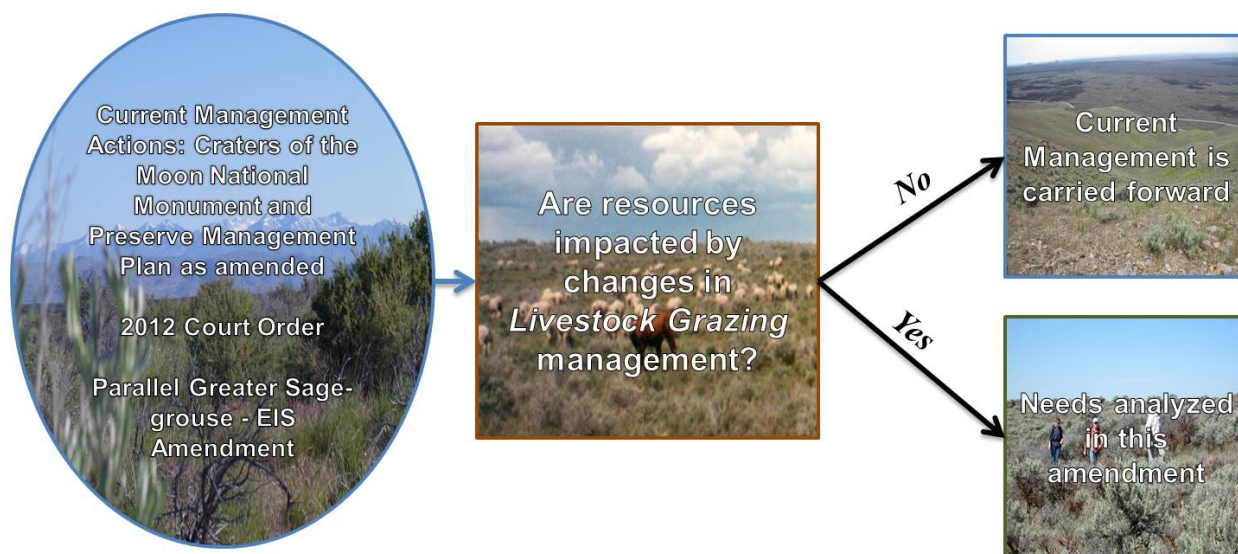
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## 2.1. How to Read This Chapter

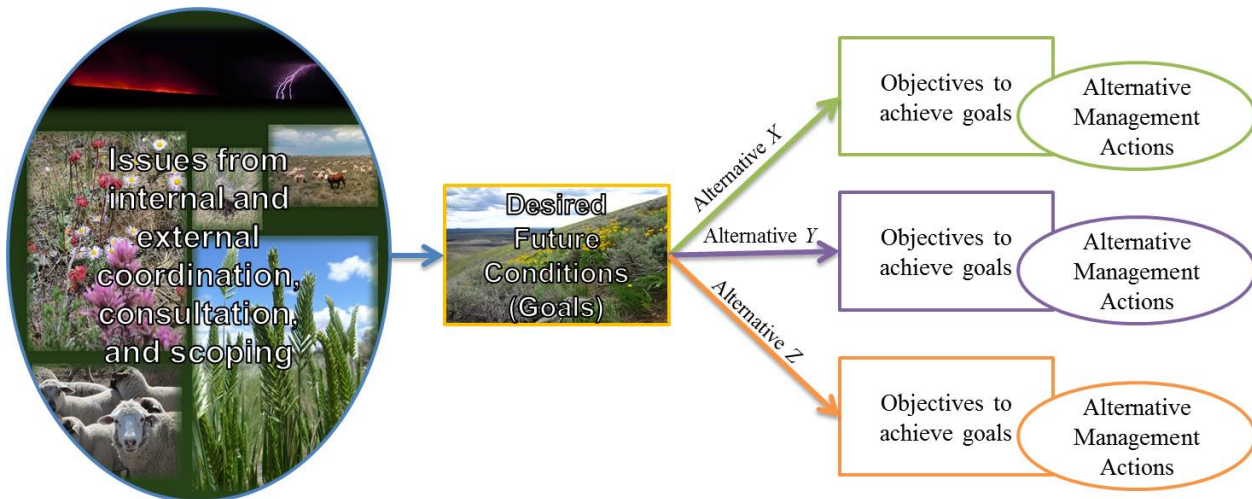
Development and evaluation of a reasonable range of alternatives is required by NEPA, CEQ regulations [40 CFR1502.14], and BLM and NEPA planning handbooks (H-1601-1 and H-1790-1, respectively). This Draft MMP Amendment/EIS evaluates five resource management alternatives including the continuation of current management, or no action alternative. The process used in deciding what topics needed to be analyzed in depth for this amendment, including incorporation of consistent and valid management practices from the current land use plan is described in Figure 2.1, “Process Used to Define Analysis Topics”. The process used to develop alternatives to the current management alternative is depicted in Figure 2.2, “Process Used to Develop Alternatives to Current Management (No Action)”. These alternatives constitute a range of reasonable public-land management actions that set different priorities and measures.

Although each alternative has unique objectives and management actions, some management actions are common to some or all alternatives. Each alternative represents a complete land use plan amendment that could guide management in the planning area.

The alternatives were developed to address the purpose and need for action discussed in section 1.2. Management actions from the 2007 MMP that are still applicable were carried forward. Some management actions were not considered because they: (1) did not meet BLM planning criteria within the scope for this amendment, or (2) were not consistent with current policy or guidance.



**Figure 2.1. Process Used to Define Analysis Topics**



**Figure 2.2. Process Used to Develop Alternatives to Current Management (No Action)**

DFCs describe the goals or outcomes for the next 20+ years within the planning area (see Section 1.8, “Overall Vision”). To support these broad DFCs, additional management actions were developed for this MMP Amendment that describe a measurable process to achieve them. DFCs are an important consideration in alternative development, MMP implementation, and monitoring effectiveness. Management actions may vary across alternatives.

## 2.2. General Description of Alternatives

This draft MMP Amendment/EIS considers five alternatives. Alternative A is the current management based on guidance from the 2007 MMP. Alternatives B, C, D, and E represent a reasonable and feasible range of management options that emphasize different resource use combinations, allocations, and management actions to address issues and improve consistency. The management actions comprised by each alternative are identified in Section 2.5. Each alternative represents a complete plan, developed to be flexible as technology and management policies change. The decisions from the GRSG ARMPA apply to all alternatives.

### Management Zones

All Federal lands within the Monument are currently assigned to one of four management zones. The management zones - Frontcountry, Passage, Primitive, and Pristine - guide future management actions within the Monument (see Figure 2.3, “Craters of the Moon National Monument and Preserve Management Zones” and Table 2.1, “Management Zone Areas in Craters of the Moon” for an acres breakdown). For a detailed description of each Zone, see the 2007 MMP. The basic concept of each Zone is as follows:

The Frontcountry Zone is defined by structures and grounds provided for visitor support services such as information, education, and recreation. Access is easy and convenient and the encounter rate with other visitors is very high.

The Passage Zone is intended to accommodate the flow of people and vehicles from one place to another and to provide minimal accommodations such as parking, trailheads, primitive campsites, and information kiosks or signs for people preparing to venture into the Primitive and/or Pristine Zones of the Monument.

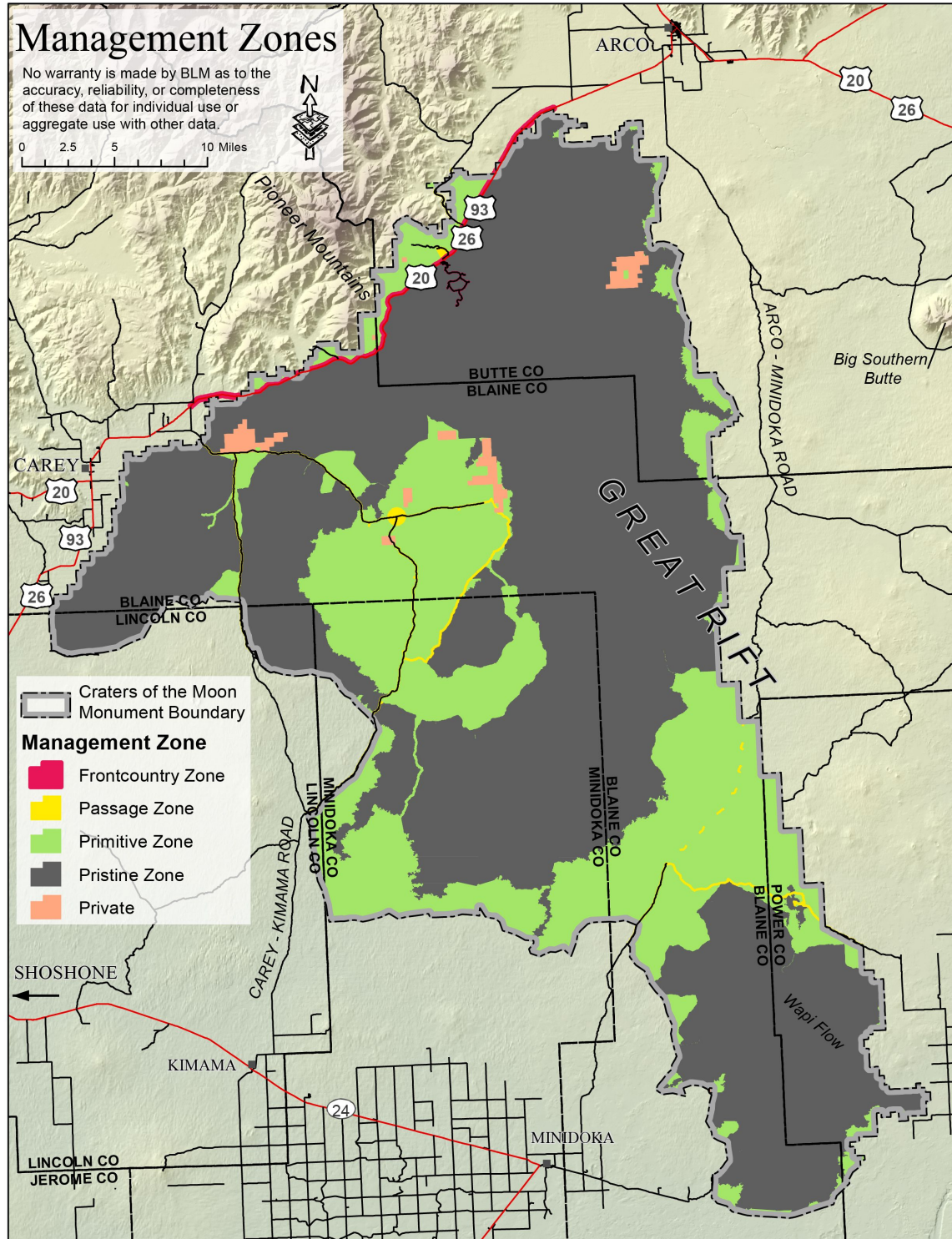
The Primitive Zone provides an undeveloped, primitive, and self-directed visitor experience while accommodating motorized and mechanized access on designated routes. Facilities are rare and provided only where essential for resource protection.

The Pristine Zone includes mostly lava flows, designated Wilderness, and Wilderness Study Areas. This zone provides an undeveloped, primitive, and self-directed visitor experience, generally without motorized or mechanized access. Facilities are virtually nonexistent.

**Table 2.1. Management Zone Areas in Craters of the Moon**

<b>Management Zone</b>	<b>BLM-Managed Acres</b>	<b>NPS-Managed Acres</b>	<b>Percent of BLM-Managed Acres in the Total Monument</b>
Frontcountry Zone	218	2,070	< 1%
Passage Zone	5,700	794	1%
Primitive Zone	202,100	10,146	27%
Pristine Zone	67,100	450,333	9%





**Figure 2.3. Craters of the Moon National Monument and Preserve Management Zones**

### 2.2.1. Alternative A

CEQ regulations at Section 1502.14(d) require an EIS to analyze the “No Action” Alternative. The No Action Alternative is defined as no change from current management direction and may also be referred to as “No Action” or “Alternative A” in this document. The existing designations, allowable uses, and management actions contained in the 2007 MMP would continue to be implemented, unless changed by laws, regulations, or policies.

Alternative A serves as the baseline for comparison with the other four alternatives.

The amount of forage allocated in the Monument is 38,187 animal unit months (AUMs, the amount of forage needed to support a cow/calf pair or livestock equivalent for one month) and is based on the best available GIS data. This total is based on the percentage of BLM land within the Monument, compared to the total BLM land within each allotment. The 2007 MMP estimated the forage available in the Monument based on the calculated percentage of each allotment within the Monument compared to the size of the entire allotment, regardless of land ownership within the allotment boundary. The GIS data at that time calculated the forage at 36,963 AUMs. This is not a change in the total forage allocation, merely a more accurate estimate of the current condition.

Actual livestock use for allotments in the Monument, however, has been much lower than the permitted numbers since 1998 when Idaho Standards were implemented. The 15-year average actual use for allotments in the Monument has been determined to be 11,791 AUMs with a range of 7,744 AUMs to 16,805 AUMs in any particular year. The full range of Actual Use, while accounting for fires, varying forage conditions, and permittee operations is 5,847 AUMs to 19,388 AUMs. This range is based on adding the low actual use for each allotment compared to the high actual use for each allotment since 1997. Approximately 1,200 acres are currently unavailable for grazing, leaving 273,900 acres of BLM land open to grazing in the Monument.

Under the No Action Alternative, livestock grazing would continue to be managed under direction found in the 2007 MMP, which will be analyzed in two ways:

1. Actual use: 11,791 AUMs over 273,900 acres of public land based on a 15-year average arrives at the existing condition.
2. Full permitted use: Active permitted livestock use of 38,187 AUMs annually over 273,900 acres of public land analyzes full implementation of the alternative.

In addition:

- No new areas of livestock exclusion would be proposed in this alternative.
- All management actions related to livestock grazing and sage-grouse management that were outlined in the 2007 MMP would be carried forward. The decisions in the GRSG ARMPA are common to all alternatives, including the No Action Alternative.
- Idaho Standards for Rangeland Health would be the driving force in determining livestock grazing levels (permitted use) and practices (grazing systems) in the future, within the current licensed use. Upon completion of Land Health Assessments (LHAs), it would be determined whether Standards are being met, and if not, the causes for not meeting the Standard(s) would

be determined. If current livestock grazing practices were determined to be the cause of an allotment not meeting one or more standards, then livestock grazing practices would be changed. Some practices that could be considered include, but are not limited to, changes in:

- Season or timing of use
  - Duration and/or level of use (AUMs)
  - Grazing schedules (including rest or deferment)
  - Numbers of livestock
  - Distribution of livestock use
  - Kind of livestock (e.g., cattle, sheep, horses, or goats)
  - Voluntary measures such as temporary non-use.
- New range improvements for management of livestock would continue to be considered on a case-by-case basis. All new livestock developments would be designed to benefit the resources affected and help achieve Standards, and must be compatible with achievement of MMP goals and objectives. No new livestock developments would be permitted in the Bowl Crater Allotment or the North Pasture of Laidlaw Park Allotment unless they result in a net benefit to those resources identified as needing improvement or protection.

### **2.2.2. Alternative B**

Alternative B, emphasizes protection of Monument values and biological resources, including habitat values for greater sage-grouse, through significantly reduced livestock grazing.

1. Livestock grazing would be removed from 6 areas (Little Park kipuka, the North Pasture of Laidlaw Park Allotment, Larkspur Park kipuka, the North Pasture of Bowl Crater Allotment, Park Field kipuka, and part of the Craters Allotment) to eliminate livestock grazing impacts to Monument features and values specifically mentioned in Proclamation 7373 (total of 19,800 acres). Existing pasture fences and natural barriers would be employed to exclude grazing from these areas.
2. The boundary between the Kimama and Poison Lake Allotments would be adjusted to coincide with the Monument boundary to resolve a management issue. Those acres in the Kimama Allotment that are within the Monument would be absorbed into the Poison Lake Allotment, and acres in the Poison Lake Allotment that are outside the Monument would be absorbed into the Kimama Allotment.
3. Approximately 254,100 acres of public lands in the Monument would be available and 21,000 acres (closed areas plus those currently unallotted) would be unavailable for livestock grazing for the life of the plan.
4. A 20% reduction from the 15-year average actual use would be applied to those areas remaining available to livestock grazing, setting the maximum number of AUMs allowed in the Monument to 9,432. AUM reductions would be implemented during the grazing permit renewal process in order of priority, based on current policy. Reduction methods could include the following:

- a. Meeting rangeland health Standards
  - b. Closing the areas identified in Alternative B and reducing the corresponding allotment AUMs proportionately
  - c. Adjusting AUMs to reflect allotment boundary adjustment removing Kimama Allotment from the Monument
  - d. Asking permittees for voluntary reductions or relinquishments
  - e. Reviewing site specific Monument values present in each allotment, such as geological features, native biological communities, wilderness character and/or WSAs.
5. Range improvements would be restricted to only allow those that would be a net benefit to wildlife habitat as determined by the Authorized Officer.
  6. Guidelines for livestock grazing management (seasons of use, stocking rates, livestock type, etc.) would be set based upon vegetation and wildlife habitat conditions/needs and would be applied during the implementation of the Plan (the Standards and Guidelines/permit renewal process).

### **2.2.3. Alternative C**

Alternative C emphasizes maintenance or enhancement of intact vegetation communities and biological integrity, and reduced impacts on greater sage-grouse habitat and life-cycle needs, through increased flexibility to use grazing as an ecological management tool.

1. Approximately 273,600 acres of public lands in the Craters of the Moon National Monument would be available for livestock grazing and 1,500 acres (closed areas plus those currently unallotted) would be unavailable for livestock grazing for the life of the plan.
2. The boundary between the Kimama and Poison Lake Allotments would be adjusted to coincide with the Monument boundary to resolve a management issue. The Kimama Allotment would be excluded from the Monument and those acres would be absorbed into the Poison Lake Allotment thereby setting the maximum AUMs at 37,792. (See Figure 1.4, “Allotment Administration” for a visual description.)
3. Where appropriate, livestock grazing could be a tool (seedings, fuel breaks, restrictions, etc.) utilized to improve or protect wildlife habitat.
4. Guidelines for livestock grazing management in each allotment/for each permit (seasons of use, stocking rates, livestock type, etc.) would be set based upon vegetation and wildlife habitat conditions/needs and would be applied during implementation of the Plan (the Standards and Guidelines/permit renewal process).

### **2.2.4. Alternative D**

Alternative D emphasizes protection for geologic, cultural, and natural resources and features through elimination of livestock grazing on BLM-administered lands within the Monument and removal of infrastructure coincident to livestock grazing management on BLM lands.



1. No grazing permits would be authorized in the Monument. No public lands would be available for livestock grazing for the life of the plan. The current livestock use authorizations would remain in effect for 2 years following the signing of the Record of Decision (43 CFR 4110.4–2(b) (2005)).
2. All livestock developments (e.g., corrals, cattleguards, fences, tanks, troughs, pipelines, reservoirs/ponds, spring developments, wells) on BLM-administered lands within the Monument would be removed or decommissioned, unless needed for fire suppression.
3. Infrastructure and disturbance attributed to livestock use and livestock management would be prioritized for removal, rehabilitation, or restoration.
4. Additional fencing may be required to keep livestock out of the Monument.
5. Monitoring data for allotments would still be collected and LHAs would still occur consistent with priorities and current policy. Because of the intermingling of private and State lands in the Monument and the BLM land adjacent to and contiguous with the Monument, each allotment would also need to be evaluated to determine the extent to which additional fencing would be required to enforce a grazing closure.

## 2.2.5. Alternative E

Alternative E emphasizes maintenance or enhancement of intact vegetation communities and biological integrity, and reduced impacts on greater sage-grouse habitat and life-cycle needs, while reducing permitted AUMs to maximum actual use levels. The AUM level in Alternative B was a reduction based on average Actual Use levels, whereas this alternative's AUM level is based on the amount of use in each allotment since the implementation of Idaho's Standards for Rangeland Health. Use levels have fluctuated in the Monument based on variations in permitted operations, fires and subsequent closures, drought, and other annual occurrences. This level takes these variations into account and sets the AUM level based on the amount of grazing that has resulted in the current conditions.

1. Approximately 272,800 acres of public lands in the Craters of the Moon National Monument would be available for livestock grazing and 2,200 acres (closed areas plus those currently unallotted) would be unavailable for livestock grazing for the life of the plan
2. A reduction from the full permitted 38,187 AUMs would be applied to those areas available to livestock grazing, setting the maximum number of AUMs allowed in the Monument to 19,388. AUM reductions would be implemented during the grazing permit renewal process in order of priority, based on current policy. Reduction methods could include the following:
  - a. Meeting applicable rangeland health Standards.
  - b. Closing Larkspur Park and reducing the corresponding allotment AUMs proportionately
  - c. Adjusting AUMs to reflect allotment boundary adjustment removing Kimama Allotment from the Monument
  - d. Asking permittees for voluntary reductions or relinquishments
  - e. Reviewing site specific Monument values present in each allotment, such as geological features, native biological communities, wilderness character and/or WSAs.

3. The boundary between the Kimama and Poison Lake Allotments would be adjusted to coincide with the Monument boundary to resolve a management issue. The Kimama Allotment would be excluded from the Monument and those acres would be absorbed into the Poison Lake Allotment.(See Figure 1.4, “Allotment Administration” for a visual description.)
4. Larkspur Park kipuka would be closed to livestock grazing.
5. No net gain in disturbance from livestock-related infrastructure or developments would be allowed. Any new infrastructure must follow previously established corridors/areas or be offset by rehabilitation of disturbance elsewhere.
6. Where appropriate, livestock grazing could be a tool (seedings, fuel breaks, restrictions, etc.) utilized to improve or protect wildlife habitat.
7. Livestock grazing management in each allotment/for each permit (seasons of use, stocking rates, livestock type, etc.) would be set based upon vegetation and wildlife habitat conditions/needs and would be applied during implementation of the Plan (the Standards and Guidelines/permit renewal process).

## 2.3. Alternatives Considered but Not Analyzed in Detail

The ID Team members discussed and considered different alternative concepts and approaches based on future planning trends, public comments, and BLM expertise. As a result of these discussions, alternative themes were developed and revised to reflect a reasonable range of options. Some proposed alternatives were not carried forward for detailed analysis due to the following:

- They did not fulfill the requirements of FLPMA 43 United States Code (USC) Part 1701 *et seq.* or other existing regulations.
- They did not meet the purpose and need as described in Chapter 1.
- They were outside the scope of the BLM’s authority.

A brief description of the alternatives considered, but not analyzed in detail is provided below.

### Close All Kipukas to Grazing

The ID Team discussed closing all kipukas in the Monument to livestock grazing as a possible alternative. This alternative was not analyzed in detail because it was deemed too similar to Alternative D and would be duplicative. Most of the larger kipukas are analyzed for removing livestock grazing in Alternative B, but the removal of livestock grazing from Laidlaw Park, the Monument’s largest kipuka, is analyzed as part of Alternative D. It is also important to note that not all kipukas in the Monument are representative of relic vegetation. For example, Laidlaw Park has a number of rangeland seedings throughout. The rugged lava described in Proclamation 7373 did not, in this instance, protect Laidlaw Park from people, animals, and exotic plants. In addition, making Laidlaw Park unavailable to livestock grazing would result in no livestock use in Laidlaw Park, without affecting the AUM level across the rest of Monument. (This Amendment analyzes Monument-wide AUMs. If livestock use was reduced in one place, the overall AUMs would be reduced, but the reduction would have been localized and not applied over the entire Monument.)

### Passive Restoration

Passive restoration would be similar to Alternative D, but the BLM would have no active role in restoring areas that were disturbed in the past. This alternative was not analyzed in detail because it is not responsive to the purpose and need (Section 1.2, “Purpose and Need for the Monument Management Plan Amendment”) and it is addressed with management action VEG-8 in the 2007 MMP, which emphasizes proactive restoration of areas with poor to fair biotic integrity through active and passive means.

### **Aggressive Restoration**

This alternative would be similar to Alternative D, but with more concerted effort to actively return the Monument to its native state. Actions could include removal of undesirable vegetation through chemical and mechanical means, reseeding native plant species, and removing human infrastructure, for example. This alternative was not analyzed in detail because it is not responsive to the purpose and need (Section 1.2, “Purpose and Need for the Monument Management Plan Amendment”). Aggressive restoration is addressed in Alternative C, and restoration activities outside of livestock grazing were already addressed in the 2007 MMP.

### **The Governor’s Sage-Grouse Alternative**

The Governor’s sage-grouse alternative was considered in the BLM’s GRSG ARMPA. Addressing the same alternative in two EISs would be duplicative and inconsistent with NEPA practice. Section 1.2, “Purpose and Need for the Monument Management Plan Amendment” outlines the roles of the GRSG ARMPA and this MMP Amendment/EIS. In addition, the Governor’s alternative for the GRSG ARMPA was not limited to addressing grazing in the Craters of the Moon National Monument and Preserve, which is the focus of this effort.

### **Western Watersheds Project Proposed Alternative**

WWP submitted three comment letters (two dated August 21, 2013, and one dated August 23, 2013) during scoping that suggested a number of issues and concerns they felt should be addressed in the MMP Amendment. None of these concerns were specifically identified by WWP as a complete alternative, but rather as matters that needed to be taken into account by the planning team. The ID Team subsequently crafted five alternatives using input from all the public scoping comments BLM received, including the WWP comment letters.

On March 30, 2014, a representative of WWP requested a meeting with the BLM via e-mail to discuss a WWP alternative. A meeting was held on July 1, 2014 with two representatives of WWP and Idaho BLM to discuss WWP’s proposal. The BLM shared the draft alternatives the planning team had developed, and WWP commented on those alternatives. WWP suggested that Alternative C should be eliminated from analysis because they felt it was too similar to the No Action Alternative. However, Alternative C was not eliminated from analysis as it provides for flexible grazing management as a management tool and is thus substantially different from the No Action Alternative. It is part of a range of reasonable alternatives, which is required by CEQ NEPA regulations.

Based on this meeting, BLM summarized several WWP requests as a single alternative including the following elements:

- BLM-managed land in Laidlaw Park would be unavailable for livestock grazing,

- Remaining BLM Monument lands would be closed to spring grazing, early summer grazing, and winter grazing to protect greater sage-grouse and sagebrush steppe communities during these seasons,
- Utilization levels would be established for the entire Monument,
- Any lands undergoing wildfire rehabilitation and/or restoration efforts would be closed to grazing for a minimum 10-year period,
- Specific protection measures would be developed for microbiotic soil crusts,
- Designation of an Area of Critical Environmental Concern (ACEC) to protect sage-grouse habitat would be considered, and
- Livestock grazing administration, including changes in allotment boundaries, within the Monument would be changed from three field offices and the Monument to a single administering office.

WWP's proposed alternative has been considered as a whole by the BLM, and eliminated from detailed analysis for the following reasons.

Allocating BLM-managed lands within Laidlaw Park as unavailable for grazing is currently analyzed in Alternative D. The impacts of restricting spring, early summer, and winter grazing are currently analyzed in Alternatives B and D. Should the deciding official choose to select any or all of these management actions, the option to do so will have been analyzed.

Utilization levels are typically set during the grazing permit renewal process, if necessary, to allow BLM land managers to make site-specific decisions for flexibility in allotment management (i.e. allowing managers to respond to current on-the-ground conditions and updated policies). Appendix C in the BLM Planning Handbook does not include utilization levels as a necessary component of a LUP. It is an implementation-level, allotment specific decision and will not be determined at the land use plan level.

The Twin Falls District Programmatic Emergency Stabilization and Rehabilitation Plan and Environmental Assessment (October 2013), which includes the Monument area, gives BLM land managers the discretion to rest post-fire rehabilitation areas until treatment and/or resource objectives are met. There is no need to set an arbitrary 10-year rest period since the BLM has the authority to rest lands to meet emergency stabilization and rehabilitation treatment objectives.

The current 2007 MMP addresses preservation of biological soil crusts (i.e. microbiotic soil crusts) in the Monument and Preserve, while recognizing that these crusts have not been observed as a highly conspicuous element there. This may be due to soil texture and chemistry, annual precipitation amount and timing, associated vegetation, and disturbance history. However, the 2007 MMP does set a DFC and management actions for soils that include provisions for biological soil crusts. Those provisions were not vacated by the Court and will be carried forward in the MMP Amendment.

Several proposed ACECs were analyzed in the 2007 MMP but were not designated at that time. ACECs have been deemed outside the scope of this effort, and proposals for ACEC nominations were not solicited during public scoping. For these reasons, an ACEC is not analyzed.

The delegation of authority for the livestock grazing administration of the BLM Monument lands was set forth in the Updated Idaho Supplement of the Delegation of Authority Manual (IM-ID-2012-004). Delegation of Authority decisions are internal State Director decisions and not subject to formal public review and comment. As such, it would be inappropriate to make such delegation changes through the planning process.

As noted above, several elements of WWP's proposal have been incorporated into one or more of the alternatives that the BLM has developed for detailed analysis. Other elements have been deemed to be outside of the scope of this planning effort. Considering all these suggested management actions as a whole, the WWP proposed alternative did not constitute a complete land use plan amendment as the other alternatives do. After all the restrictions and additional closure areas, the Monument would be effectively closed to livestock grazing, which is analyzed in Alternative D. It was deemed too similar to Alternative D to warrant a separate analysis in the document. Based on these considerations, it was not carried forward as a stand-alone alternative.

## **2.4. Management Common to All Alternatives**

All of the management guidance in the 2007 MMP is carried forward and will continue to apply under all alternatives. See Appendix B, *Management Common to All Alternatives - Carried forward from the 2007 Craters of the Moon MMP* for a list of Management Actions that still apply. The decisions in the GRSR ARMPA are also common to all alternatives.

### **New Management Actions Common to All Alternatives**

#### ***Wildlife and Fish Management Action***

WLIFE-11A: Schedule small-scale construction and routine maintenance activities to avoid or minimize disturbance to priority species and their habitat during important seasonal periods.

## **2.5. Description of Management Actions by Alternative**

This section describes the management actions that would apply to those actions under each alternative. Land use plans identify outcomes, or DFCs, expressed in terms of specific actions which direct BLM actions.

Management actions are identified for and pertain to resources, resource uses, and social and economic conditions. They are usually quantifiable, measurable, and may have established time frames for achievement, as appropriate. Management actions can either be common to all alternatives or specific to one or more. Table 2.2, "Comparison of Management Actions by Alternative" summarizes the management actions listed below. Because livestock trailing does not fall under livestock use allocation and has been addressed in the 2013 Livestock Trailing for Shoshone Field Office EA (DOI-BLM-ID-T030-2012-0044-EA), trailing management actions are not addressed in this MMP Amendment.

### **2.5.1. Alternative A - No Action**

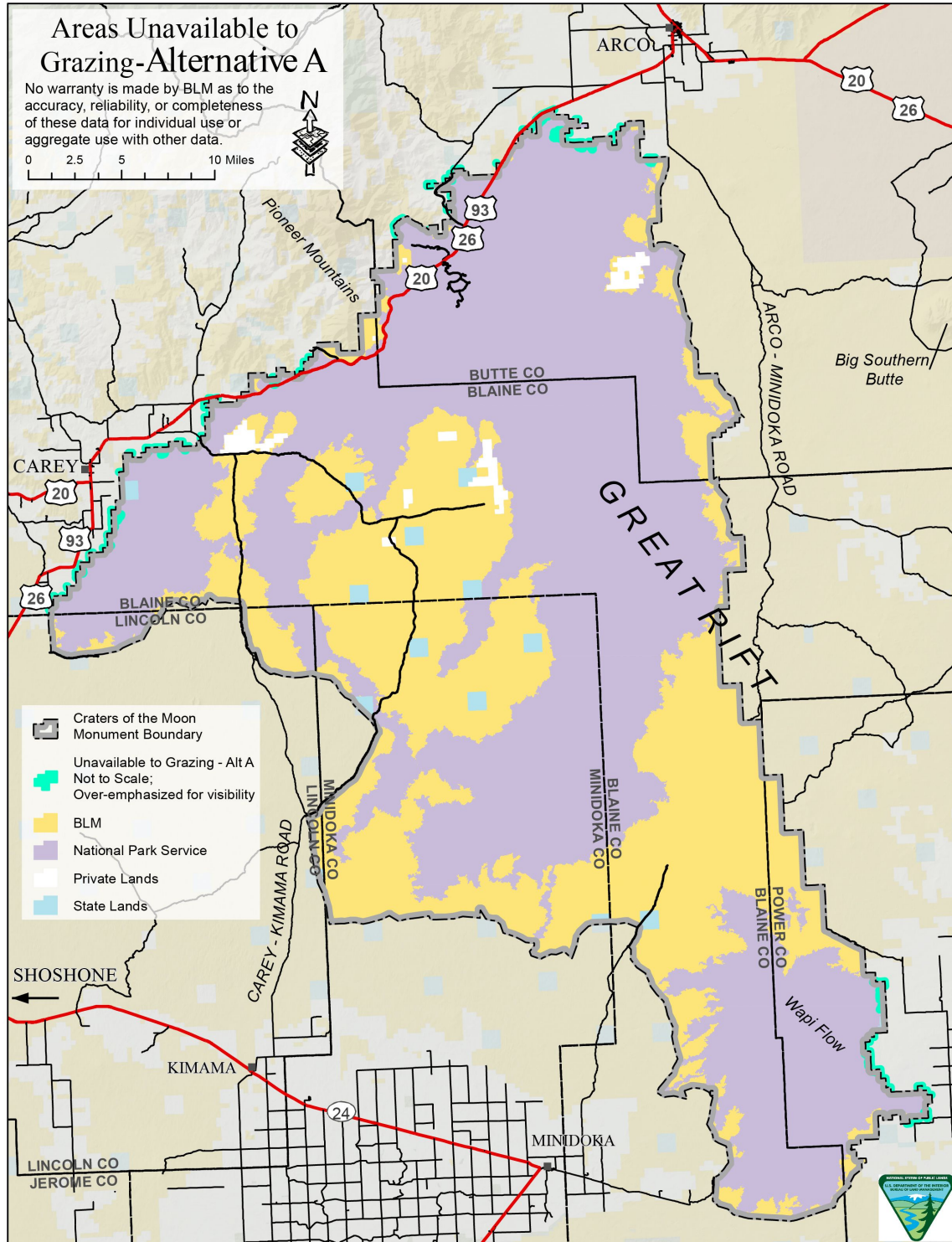
#### ***Existing Livestock Grazing Management Actions***

GRAZ-2A: BLM land available for livestock use totals approximately 273,900 acres. BLM land not available for livestock use totals approximately 1,200 acres. NPS land not available for livestock use totals approximately 463,300 acres. (Please note that acres are different from how they were identified in the 2007 MMP. Acres for this plan amendment were updated as part of a GIS data-cleaning exercise in 2013.) See Figure 2.4, “Livestock Grazing Availability-Alternative A”.

GRAZ-3A: Permitted livestock use totals 38,187 AUMs. The current livestock use authorizations will be maintained until LHAs are completed and the BLM determines that adjustments in livestock use are necessary to meet Standards, vegetation, wildlife, livestock, or resource objectives.

GRAZ-4A: Use of existing livestock developments in Primitive and Pristine Zones may continue. The BLM may remove developments if they are no longer serving a useful purpose or resource objectives warrant their removal. Sites will be restored.

GRAZ-6A: There will be no new livestock developments permitted in the Bowl Crater Allotment or the North Pasture of Laidlaw Park Allotment unless they result in a net benefit to those resources identified as needing improvement or protection.



**Figure 2.4. Livestock Grazing Availability-Alternative A**

## 2.5.2. Alternative B

### **New Management Actions proposed under Alternative B:**

#### ***Water Resources Management Actions***

WATER-4B: Implement actions that would restore all riparian areas to proper functioning condition (PFC). Where riparian areas and wet meadows meet PFC, strive to attain reference state vegetation relative to the Natural Resource Conservation Service (NRCS) Ecological Site Description.

#### ***Wildlife and Fish Resources Management Actions***

WLIFE-12B: During permit modification, develop specific habitat objectives for priority wildlife species (e.g., big game, sage-grouse, Idaho dunes tiger beetle).

#### ***Vegetation Resources Management Actions***

VEG-24B: During permit renewal, where possible, adjust grazing systems to focus livestock use on non-native perennial seedings.

#### ***Livestock Grazing Management Actions***

GRAZ-2B: BLM land available for livestock use totals 254,100 acres. BLM land not available for livestock use totals approximately 21,000 acres. NPS land not available for livestock use totals approximately 463,300 acres. See Figure 2.5, “Livestock Grazing Availability-Alternative B”.

GRAZ-3B: Permitted livestock use totals 9,432 AUMs. The current livestock use authorizations would be maintained until Idaho Standards for Rangeland Health evaluations or similar NEPA-compliant decisions identify the need for adjustments in livestock use to meet Standards, Monument values, resource objectives, or plan AUM levels. AUM reductions would be implemented during the grazing permit renewal process in order of priority based on current policy, by:

1. Closing the areas described in the alternative and reducing the corresponding allotment AUMs proportionately
2. Adjusting AUMs to reflect allotment boundary adjustment removing Kimama Allotment from the Monument
3. Accepting voluntary reductions or relinquishments from permittees
4. Reviewing site specific Monument values present in each allotment, such as native biological communities, wilderness character and/or WSAs, and sage-grouse habitat.

GRAZ-4B: All livestock developments (e.g., corrals, cattleguards, fences, tanks, troughs, pipelines, reservoirs/ponds, spring developments, wells) in areas that are unavailable for livestock grazing would be identified, analyzed, and prioritized for removal, consolidation, or modification to maintain and improve intact habitats.

GRAZ-6B: There would be no new livestock developments in areas closed to grazing.



GRAZ-7B: Adjust the Poison Lake and Kimama Allotment boundaries to coincide with the Monument and Preserve boundary.

GRAZ-8B: Locate new salt, minerals, supplements, troughs, reservoirs, and holding facilities more than 200 meters from lava edges and playas, to ensure that they avoid conflicts with cultural resources. Evaluate existing water developments and corrals to identify conflicts with cultural resources, and prioritize for removal or relocation if a conflict exists.

GRAZ-14B: In allotments with a single permittee and/or intact native plant communities, prioritize retiring the permit or closing the allotment if grazing privileges are relinquished or an allotment becomes vacant.

GRAZ-15B: No spring or early summer livestock grazing (March 15 - June 15) would be allowed in sage-grouse nesting or early brood-rearing (i.e., breeding) habitats .<sup>1</sup>

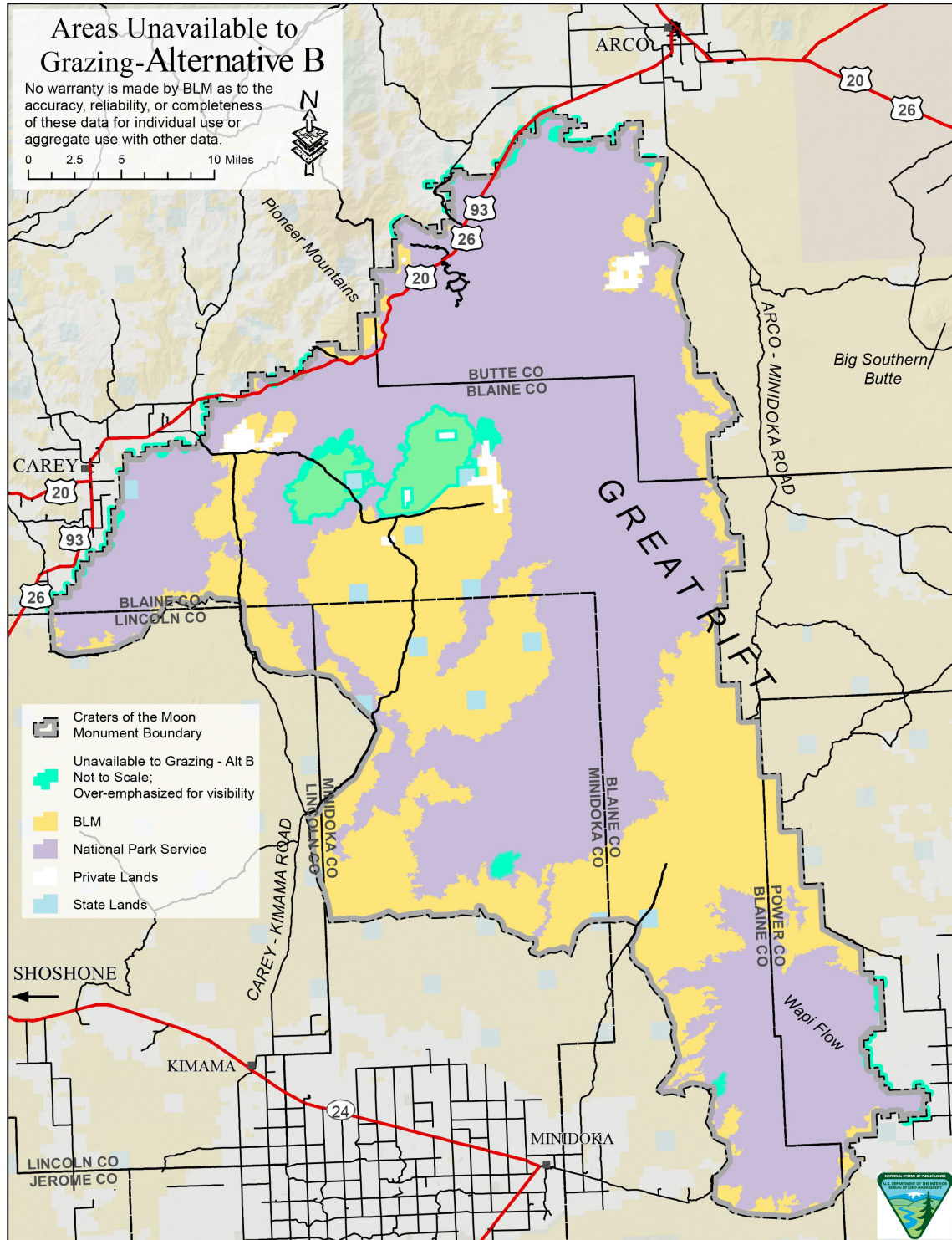
GRAZ-22B: No new spring developments will be permitted.

GRAZ-25B: During implementation (i.e. permit renewal) and when/where necessary, provide flexibility in grazing permit terms and conditions to allow annual/seasonal adjustments in the intensity, timing, duration and frequency of grazing use over time that best supports management objectives.

GRAZ-26B: Conversions in kind of livestock may be allowed as long as the following are addressed through an appropriate environmental review:

- Concerns of other permittees in the affected allotment would be considered in analysis of the conversion proposal
- The amount of AUMs converted from one livestock kind to another would be in proportion to the allotment's suitability for grazing that kind of livestock
- All conversions would be initially conservative (50% conversion for the first 3 years as modified by suitability and water availability)
- Necessary range improvements would be completed prior to livestock use
- Results of ongoing monitoring studies would determine whether the new AMP and level of conversion is satisfactory
- Final conversion levels will depend on the desired season of use, initial balance between spring and fall sheep use, and resource response to that use.

<sup>1</sup>The breeding season dates (March 15- June 15) are consistent with the Breeding/Nesting Season identified in the NMV LWG Sage-grouse Conservation Plan (2011). These seasonal dates are specific to management actions 15B, C, and E. The focus of these dates is to capture the core of the breeding season as identified in the NMV LWG Sage-grouse Conservation Plan (2011). Table 2-2 of ID/SW MT Greater Sage-Grouse RMP Amendment identifies a Lek Habitat seasonal use period from March 1 to May 15, and a Nesting/Early Brood Rearing seasonal use period from May 1 to June 30. Cumulatively, these seasonal dates are broader. However, Table 2-2 of the Amendment also identifies that seasonal dates can be adjusted by local unit according to geographic region. Although, the core of breeding season for this amendment has been identified as March 15 to June 15, these dates may be adjusted to reflect the broader seasonal habitat dates identified in the Table 2-2 of the ID/SW MT Greater Sage-Grouse RMP Amendment.



**Figure 2.5. Livestock Grazing Availability-Alternative B**

### 2.5.3. Alternative C

#### **New Management Actions proposed under Alternative C**

##### ***Water Resources Management Actions***

WATER-4C: Implement actions that would restore all riparian areas to PFC.

##### ***Vegetation Resources Management Actions***

VEG-24C: During permit renewal, where possible, adjust grazing systems to focus livestock use on non-native perennial seedings.

VEG-25C: Consider directing grazing for sagebrush recovery and/or to benefit the diversity of seedings.

VEG-26C: Identify and implement scientific reference areas to study the effects of livestock grazing on different vegetation communities/conditions. Each reference area would be paired with an adjacent grazed area in a similar vegetation type and condition to monitor the effects of livestock grazing on a variety of plant communities. The absence of grazing would be the only difference between management of reference areas and that of adjacent areas with similar vegetation. Each reference area would be a minimum of 40 acres, and the total acreage of all reference areas would not exceed 1,000 acres. Fencing would vary depending on the objective of the treatment, but would be built to meet BLM standards.

##### ***Livestock Grazing Management Actions***

GRAZ-2C: BLM land available for livestock use totals 273,600 acres. BLM land not available for livestock use totals approximately 1,500 acres. NPS land not available for livestock use totals approximately 463,300 acres. See Figure 2.6, “Livestock Grazing Availability-Alternative C”.

GRAZ-3C: Total permitted livestock use is 37,792 AUMs. The current livestock use authorizations would be maintained until Idaho Standards evaluations or similar NEPA-compliant decisions identify the need for adjustments in livestock use to meet Standards, vegetation, wildlife, livestock, resource objectives, or plan AUM levels.

GRAZ-7C: Adjust the Poison Lake and Kimama Allotment boundaries to coincide with the Monument and Preserve boundary.

GRAZ-8C: Locate new salt, minerals, supplements, troughs, reservoirs, and holding facilities more than 200 meters from lava edges and playas, to ensure that they avoid conflicts with cultural resources. Evaluate existing water developments and corrals to identify conflicts with cultural resources, and prioritize for removal or relocation if a conflict exists.

GRAZ-12C: During permit modification, use monitoring information and LHAs to develop specific management objectives and grazing management plans designed to maintain, enhance, or restore vegetation condition.

GRAZ-13C: When livestock management practices are not meeting or making progress towards Standards, implement changes in grazing management through grazing authorization modifications, or AMP implementation. In the analysis the following actions must be considered, but are not limited to:

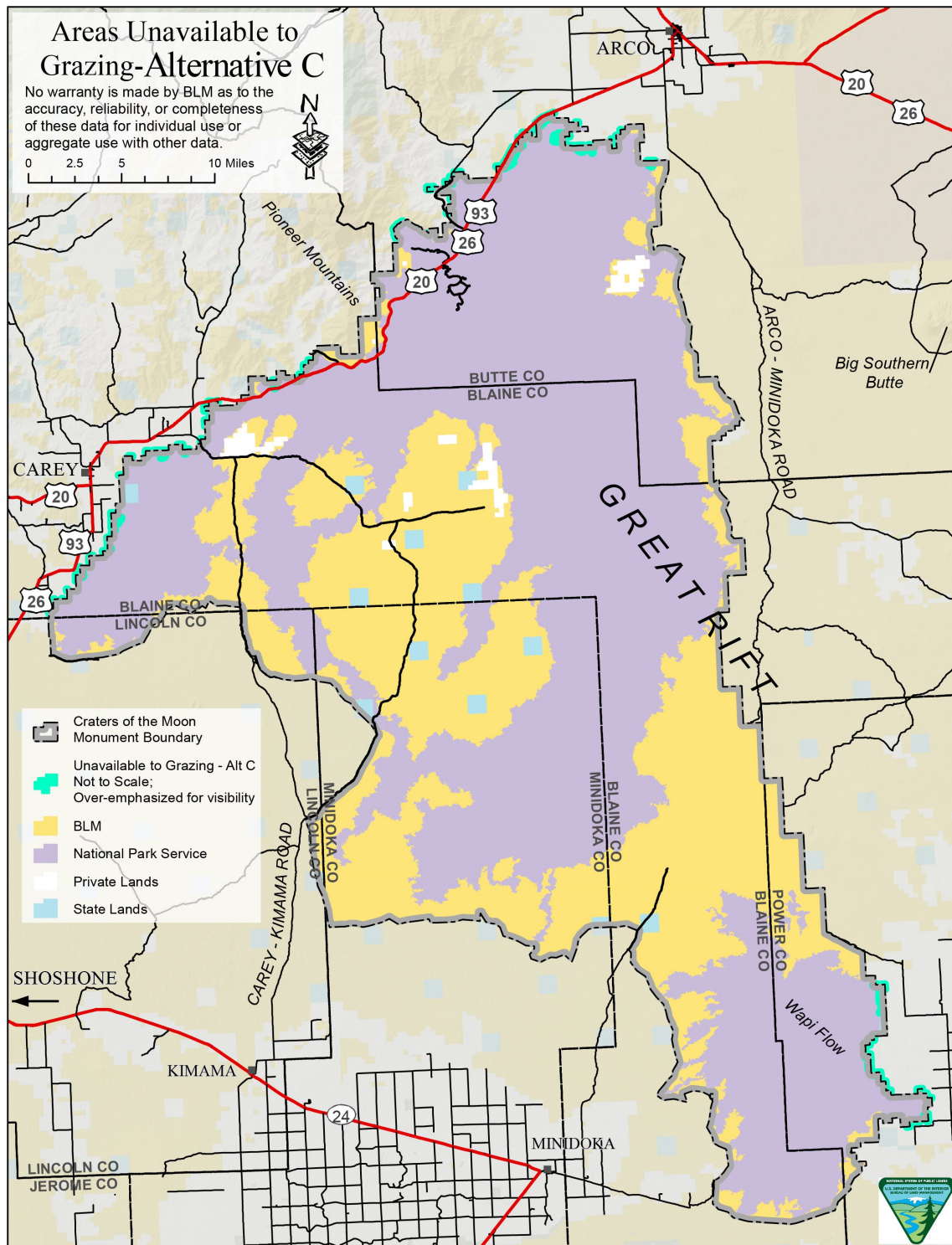
- Season or timing of use;
- Duration and/or level of use (AUMs);
- Grazing schedules (including rest or deferment).

GRAZ-15C: Within sage-grouse nesting or early brood-rearing (i.e., breeding) habitats, coordinate with the permittee to manage grazing use to avoid the sage-grouse breeding period (March 15 - June 15)<sup>1</sup>, such as through rotations, scheduling, or managing water sources when practical.

GRAZ-25C: During implementation (i.e. permit renewal) and when/where necessary, provide flexibility in grazing permit terms and conditions to allow annual/seasonal adjustments in the intensity, timing, duration and frequency of grazing use over time that best supports management objectives.

GRAZ-26C: Conversions in kind of livestock may be allowed as long as the following are addressed through an appropriate environmental review:

- Concerns of other permittees in the affected allotment would be considered in analysis of the conversion proposal
- The amount of AUMs converted from one livestock kind to another would be in proportion to the allotment's suitability for grazing that kind of livestock
- All conversions would be initially conservative (50% conversion for the first 3 years as modified by suitability and water availability)
- Necessary range improvements would be completed prior to livestock use
- Results of ongoing monitoring studies would determine whether the new AMP and level of conversion is satisfactory
- Final conversion levels will depend on the desired season of use, initial balance between spring and fall sheep use, and resource response to that use.



**Figure 2.6. Livestock Grazing Availability-Alternative C**

## **2.5.4. Alternative D**

### **New Management Actions in Alternative D:**

#### ***Water Resources Management Actions***

WATER-4D: Implement actions that would restore all riparian areas to PFC.

#### ***Livestock Grazing Management Actions***

GRAZ-2D: BLM land available for livestock use totals 0 acres. BLM land not available for livestock use totals approximately 275,100 acres. NPS land not available for livestock use totals approximately 463,300 acres. See Figure 2.7, “Livestock Grazing Availability-Alternative D”.

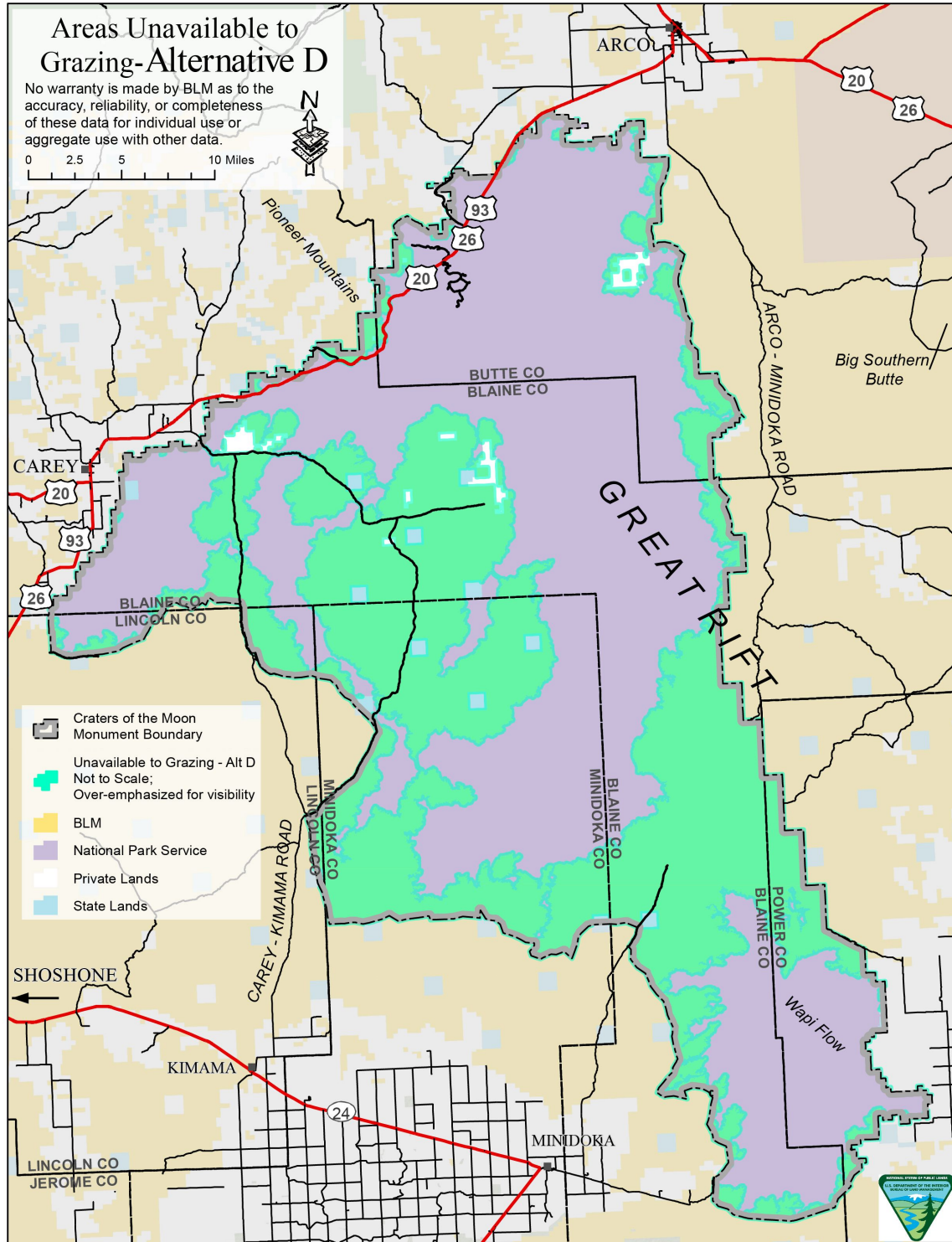
GRAZ-3D: No livestock grazing would be permitted through the life of the plan. The current livestock use authorizations would remain in effect until 2 years from the signing of the ROD. [43 CFR 4110.4-2(b) (2005)]

GRAZ-4D: Infrastructure coincident to livestock grazing management on BLM lands would be removed or decommissioned. Access and developments related to State and private lands would remain.

GRAZ-6D: There would be no new livestock developments on public land in the Monument.

GRAZ-7D: Adjust the Poison Lake and Kimama Allotment boundaries to coincide with the Monument and Preserve boundary.





**Figure 2.7. Livestock Grazing Availability-Alternative D**

## 2.5.5. Alternative E

### **New Management Actions in Alternative E:**

#### ***Water Resources Management Actions***

WATER-4E: Implement actions that would restore all riparian areas to proper functioning condition (PFC).

#### ***Vegetation Resources Management Actions***

VEG-24E: During permit renewal, where possible, adjust grazing systems to focus livestock use on non-native perennial seedings.

VEG-25E: Consider directing grazing for sagebrush recovery and/or to benefit the diversity of seedings.

VEG-26E: Identify and implement scientific reference areas to study the effects of livestock grazing on different vegetation communities/conditions. Each reference area would be paired with an adjacent grazed area in a similar vegetation type and condition to monitor the effects of livestock grazing on a variety of plant communities. The absence of grazing would be the only difference between management of reference areas and that of adjacent areas with similar vegetation. Each reference area would be a minimum of 40 acres, and the total acreage of all reference areas would not exceed 1,000 acres. Fencing would vary depending on the objective of the treatment, but would be built to meet BLM standards.

#### ***Livestock Grazing Management Actions***

GRAZ-2E: BLM land available for livestock use totals 272,800 acres. BLM land not available for livestock use totals approximately 2,200 acres. NPS land not available for livestock use totals approximately 463,300 acres. See Figure 2.8, "Livestock Grazing Availability-Alternative E".

GRAZ-3E: Permitted livestock use totals 19,388 AUMs. The current livestock use authorizations would be maintained until Idaho Standards for Rangeland Health evaluations or similar NEPA-compliant decisions identify the need for adjustments in livestock use to meet Standards, Monument values, resource objectives, or plan AUM levels. AUM reductions would be implemented during the grazing permit renewal process in order of priority based on current policy, by:

1. Meeting applicable rangeland health Standards.
2. Closing Larkspur Park and reducing the corresponding allotment AUMs proportionately
3. Adjusting AUMs to reflect allotment boundary adjustment removing Kimama Allotment from the Monument
4. Accepting voluntary reductions or relinquishments from permittees
5. Reviewing site specific Monument values present in each allotment, such as native biological communities, wilderness character and/or WSAs.



GRAZ-6E: No net increase in disturbance from livestock-related infrastructure or developments would be allowed. Any new infrastructure must follow previously established corridors/areas or be offset by rehabilitation of disturbance elsewhere. Disturbance buffers for new infrastructure follow:

- Fences and pipelines — must be within route disturbance (20 ft. from center of primitive roads, 30 ft. from center of roads)
- Troughs and wells — must be within a historically used watering site, identified prior to development
- Corrals — must remain within existing corral sites

GRAZ-7E: Adjust the Poison Lake and Kimama Allotment boundaries to coincide with the Monument and Preserve boundary.

GRAZ-8E: Locate new salt, minerals, supplements, troughs, reservoirs, and holding facilities more than 200 meters from lava edges and playas, to ensure that they avoid conflicts with cultural resources. Evaluate existing water developments and corrals to identify conflicts with cultural resources, and prioritize for removal or relocation if a conflict exists.

GRAZ-12E: During permit modification, use monitoring information and LHAs to develop specific management objectives and grazing management plans designed to maintain, enhance, or restore vegetation condition.

GRAZ-13E: When livestock management practices are not meeting or making progress towards Standards, implement changes in grazing management through grazing authorization modifications, or AMP implementation. The following actions must be considered, but are not limited to, in the analysis:

- Season or timing of use
- Duration of use
- Level of use (AUMs)
- Grazing schedules (including rest or deferment).

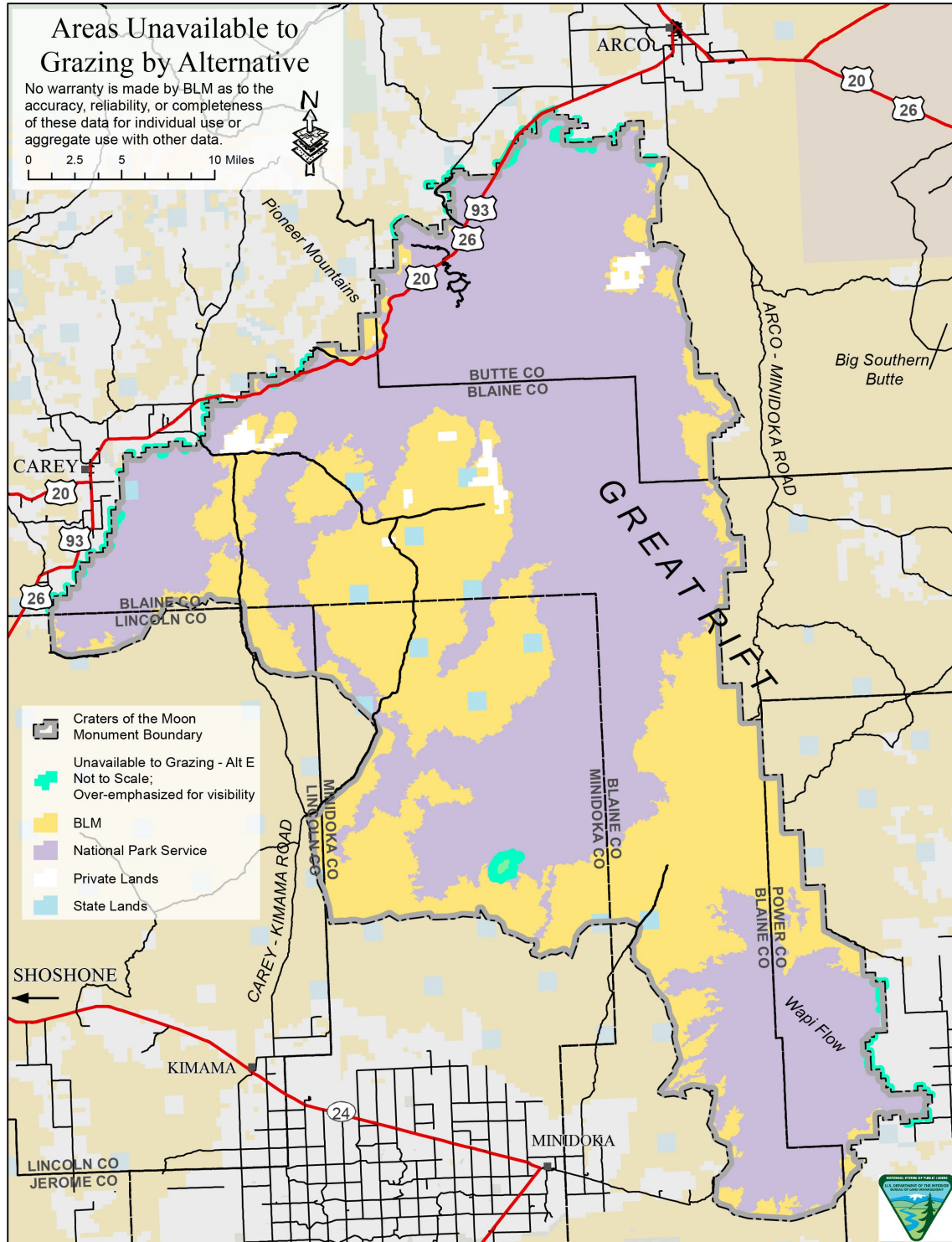
GRAZ-15E: Within sage-grouse nesting or early brood-rearing (i.e., breeding) habitats, coordinate with the permittee to manage grazing use to avoid the sage-grouse breeding period (March 15 - June 15)<sup>1</sup>, such as through rotations, scheduling, or managing water sources when practical.

GRAZ-25E: During implementation and where necessary, modify grazing management to meet seasonal sage-grouse habitat requirements. When practical, provide flexibility in grazing permit terms and conditions to allow annual/seasonal adjustments in the intensity, timing, duration, and frequency of grazing use over time that best supports management objectives.

GRAZ-26E: Conversions in kind of livestock may be allowed as long as the following are addressed through an appropriate environmental review:

- Concerns of other permittees in the affected allotment would be considered in analysis of the conversion proposal

- The amount of AUMs converted from one livestock kind to another would be in proportion to the allotment's suitability for grazing that kind of livestock
- All conversions would be initially limited (50% conversion for the first 3 years as modified by suitability and water availability)
- Necessary range improvements would be completed prior to livestock use
- Results of ongoing monitoring studies would determine whether the new AMP and level of conversion is satisfactory
- Final conversion levels will depend on the desired season of use, initial balance between spring and fall sheep use, and resource response to that use.



**Figure 2.8. Livestock Grazing Availability-Alternative E**

## **2.6. Comparison of Alternatives**

The Comparison of Alternatives table below summarizes all new management actions proposed under Alternatives A through E, which would be in addition to the current management actions in the existing plan.

**Table 2.2. Comparison of Management Actions by Alternative**

Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Water Resources		WATER-4B: Implement actions that would restore all riparian areas to PFC. Wherever riparian areas and wet meadows meet PFC, strive to attain reference state vegetation relatives to the NRCS Ecological Site Description.	WATER-4C: Implement actions that would restore all riparian areas to PFC.	Same as Alternative B.	Same as Alternative C.
Wildlife and Fish	WLIFE-11A: Schedule small-scale construction and routine maintenance activities to avoid or minimize disturbance to priority species and their habitat during important seasonal periods.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
		WLIFE-12B: During permit modification, develop specific habitat objectives for priority wildlife species (e.g., big game, sage-grouse, Idaho dunes tiger beetle).		N/A	
Vegetation Resources		VEG-24B: During permit renewal, where possible, adjust grazing systems to focus livestock use on non-native perennial seedings with the primary purpose of deferral or rest and/or reduced utilization levels in areas of desirable native vegetation. (Monument-wide)	Same as Alternative B.	N/A	Same as Alternative B.
			VEG-25C: Consider directing grazing for sagebrush recovery and/or	N/A	Same as Alternative C.

Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
			to benefit the diversity of seedings.		
			VEG-26C: Identify and implement scientific reference areas to study the effects of livestock grazing on different vegetation communities/conditions. Each reference area would be paired with an adjacent grazed area in a similar vegetation type and condition to monitor the effects of livestock grazing on a variety of plant communities. The absence of grazing would be the only difference between management of reference areas and that of adjacent areas with similar vegetation. Each reference area would be a minimum of 40 acres, and the total acreage of all reference areas would not exceed 1,000 acres. Fencing would vary depending on the objective of the treatment, but would be built to meet BLM standards.	N/A	Same as Alternative C.

Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Livestock Grazing	GRAZ-2A: BLM land available for livestock use totals approximately 273,900 acres. BLM land not available for livestock use totals approximately 1,200 acres. NPS land not available for livestock use totals approximately 463,300 acres.	GRAZ-2B: BLM land available for livestock use totals 254,100 acres. BLM land not available for livestock use totals approximately 21,000 acres. NPS land not available for livestock use totals approximately 463,300 acres.	GRAZ-2C: BLM land available for livestock use totals 273,600 acres. BLM land not available for livestock use totals approximately 1,500 acres. NPS land not available for livestock use totals approximately 463,300 acres.	GRAZ-2D: BLM land available for livestock use totals 0 acres. BLM land not available for livestock use totals approximately 275,100 acres. NPS land not available for livestock use totals approximately 463,300 acres.	GRAZ-2E: BLM land available for livestock use totals 272,800 acres. BLM not available for livestock use totals approximately 2,200 acres. NPS land not available for livestock use totals approximately 463,300 acres.
	GRAZ-3A: Permitted livestock use totals 38,187 AUMs. The current livestock use authorizations will be maintained until Idaho Standards for Rangeland Health evaluations or similar NEPA-compliant decisions identify the need for adjustments in livestock use to meet Standards, vegetation, wildlife, livestock, or resource objectives.	GRAZ-3B: Permitted livestock use totals 9,432 AUMs. The current livestock use authorizations would be maintained until Idaho Standards for Rangeland Health evaluations or similar NEPA-compliant decisions identify the need for adjustments in livestock use to meet Standards, Monument values, resource objectives, or plan AUM levels. AUM reductions would be implemented during the grazing permit renewal process in order of priority based on current policy, by: 1) Meeting rangeland health Standards, 2) Closing the areas identified in alternative B and reducing the corresponding allotment AUMs proportionately, 3) Adjusting AUMs to reflect allotment boundary	GRAZ-3C: Permitted livestock use totals 37,792 AUMs. The current livestock use authorizations would be maintained until Idaho Standards for Rangeland Health evaluations or similar NEPA-compliant decisions identify the need for adjustments in livestock use to meet Standards, vegetation, wildlife, livestock, resource objectives, or plan AUM levels.	GRAZ-3D: No livestock grazing will be permitted through the life of the plan. The current livestock use authorizations would remain in effect until 2 years from the signing of the ROD. (43 CFR 4110.4-2(b)(2005))	GRAZ-3E: Permitted livestock use totals 19,388 AUMs. The current livestock use authorizations would be maintained until Idaho Standards for Rangeland Health evaluations or similar NEPA-compliant decisions identify the need for adjustments in livestock use to meet Standards, Monument values, resource objectives, or plan AUM levels. AUM reductions would be implemented during the grazing permit renewal process in order of priority based on current policy, by: 1) Meeting rangeland health Standards, 2) Closing the areas identified in the alternative and reducing the corresponding allotment AUMs proportionately, 3) Adjusting AUMs to reflect allotment boundary

Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
		adjustment removing Kimama Allotment from the Monument, 4) Accepting voluntary reductions or relinquishments from permittees, and 5) Reviewing site specific Monument values present in each allotment, such as native biological communities, wilderness character and/or WSAs.			adjustment removing Kimama Allotment from the Monument, 4) Accepting voluntary reductions or relinquishments from permittees, and 5) Reviewing site specific Monument values present in each allotment, such as native biological communities, wilderness character and/or WSAs.
	GRAZ-4A: Use of existing livestock developments in Primitive and Pristine Zones may continue. The BLM may remove developments if they are no longer serving a useful purpose or resource objectives warrant their removal. Sites will be restored. Consider removing projects that are not needed for livestock management throughout Monument or negatively effect GRSG habitat.	GRAZ-4B: All livestock developments (e.g., corrals, cattleguards, fences, tanks, troughs, pipelines, reservoirs/ponds, spring developments, wells) in areas that are unavailable for livestock grazing would be identified, analyzed, and prioritized for removal, consolidation, or modification to maintain and improve intact habitats.	Same as Alternative A.	GRAZ-4D: Infrastructure coincident to livestock grazing management on BLM lands would be removed or decommissioned. Access and developments related to state and private lands would remain.	Same as Alternative A.
	GRAZ-6A: There will be no new livestock developments permitted in the Bowl Crater Allotment and the North Pasture of the Laidlaw Park Allotment unless they result in a net benefit to those resources identified as	GRAZ-6B: There would be no new livestock developments in areas closed to grazing.	Same as Alternative A.	GRAZ-6D: There would be no new livestock developments in the Monument.	GRAZ-6E: No net gain in disturbance from livestock-related infrastructure or developments would be allowed. Any new infrastructure must follow previously established corridors/areas or be offset by rehabilitation



Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
	needing improvement or protection.				of disturbance elsewhere. Disturbance buffers for new infrastructure follow: Fences and Pipelines-must be within route disturbance (20 ft from center of primitive roads, 30 ft from center of roads) Troughs and Wells-must be within a historically used watering site (to be identified prior to project) Road-30 ft from center Primitive Road-20 ft from center Corral-must remain within an existing corral site
		GRAZ-7B: Adjust the Poison Lake and Kimama Allotment boundaries to coincide with the Monument and Preserve boundary.	Same as Alternative B.	Same as Alternative B.	Same as Alternative B.
		GRAZ-8B: Locate new salt, minerals, supplements, troughs, reservoirs, and holding facilities more than 200 meters from lava edges and playas, to ensure that they avoid conflicts with cultural resources. Evaluate existing water developments and corrals to identify conflicts with cultural resources, and prioritize for removal or relocation if a conflict exists.	Same as Alternative B.	N/A	Same as Alternative B.
			GRAZ-12C: During permit modification, use	N/A	Same as Alternative C.

Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
			monitoring information and LHAs to develop specific management objectives and grazing management plans designed to maintain, enhance, or restore vegetation condition.		
			GRAZ-13C: When livestock management practices are not meeting or making progress towards Standards, implement changes in grazing management through grazing authorization modifications, or AMP implementation. The following actions must be considered, but are not limited to, in the analysis: 1) Season or timing of use 2) Duration and/or level of use (AUMs) 3) Grazing schedules (including rest or deferment).	N/A	Same as Alternative C.
		GRAZ-14B: In allotments with a single permittee and/or intact native plant communities, prioritize retiring the permit or closing the allotment if grazing privileges are relinquished or an allotment becomes vacant.		N/A	
		GRAZ-15B: No spring or early summer livestock grazing (March 15- June 15) would be allowed in	GRAZ-15C: In sage-grouse nesting or early brood-rearing (i.e., breeding) habitats,	N/A	Same as Alternative C.

Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
		sage-grouse nesting or early brood-rearing (i.e., breeding) habitats.	coordinate with the permittee to manage grazing use to avoid the sage-grouse breeding period (March 15- June 15) , such as through rotations, scheduling, or managing water sources when practical.		
		GRAZ-22B: No new spring developments will be permitted.			
		GRAZ-25B: During implementation (i.e. permit renewal) and when/where necessary, provide flexibility in grazing permit terms and conditions to allow annual/seasonal adjustments in the intensity, timing, duration and frequency of grazing use over time that best supports management objectives.	Same as Alternative B.	N/A	Same as Alternative B.
		GRAZ-26B: Conversions in kind of livestock may be allowed as long as the following are addressed through an appropriate environmental review: <ul style="list-style-type: none"> <li>• Concerns of other permittees in the affected allotment would be considered in analysis of the conversion proposal,</li> <li>• The amount of AUMs converted from one livestock kind to another would be in proportion to</li> </ul>	Same as Alternative B.	N/A	Same as Alternative B.

Resource	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
		<p>the allotment's suitability for grazing that kind of livestock,</p> <ul style="list-style-type: none"> <li>• All conversions would be initially conservative (50% conversion for the first three years as modified by suitability and water availability),</li> <li>• Necessary range improvements would be completed prior to livestock use,</li> <li>• Results of ongoing monitoring studies would determine whether the new AMP and level of conversion is satisfactory, and</li> <li>• Final conversion levels will depend on the desired season of use, initial balance between spring and fall sheep use, and resource response.</li> </ul>			

## 2.7. Comparison of Impacts

Table 2.3, “Relative Comparison of Impacts Among Alternatives” summarizes potential impacts among each of the alternatives. Where appropriate, the table quantifies potential impacts anticipated from the proposed management actions for each of the five alternatives. The table summarizes impacts under the five alternatives in acres (e.g., more acreage implies more impact, either beneficial or adverse) or qualitative descriptions comparing the impact potential among the alternatives (e.g., high potential, moderate potential, or low potential) with a brief description of the qualifying rationale.

The following table was developed in reference to Chapter 4, *Environmental Consequences*. This table does not compare each alternative to the No Action Alternative, nor does it include cumulative impacts. The Summary section for each resource in Chapter 4 provides a more detailed comparison of impacts between the alternatives and definitions of the descriptors. Please also refer to Chapter 3, *Affected Environment* for more information about specific Monument resources (i.e., number of WSAs and existing infrastructure statistics).

**Table 2.3. Relative Comparison of Impacts Among Alternatives**

Resource	Impact	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Soil Resources	Potential to stabilize soils	Lowest potential; fewest acres unavailable to grazing	Moderate potential; substantial increase in acres unavailable to grazing	Minor potential; slightly more acres unavailable to grazing than Alternative A	Highest potential; most acres unavailable to grazing	Minor to moderate potential; due to no net increase in livestock-related infrastructure disturbance
	Acres unavailable to livestock grazing	1,200	21,000	1,500	275,100	2,200
Water Resources	Potential to protect riparian vegetation, fisheries, and water quality	Minor to Moderate potential; continue management for PFC	Moderate to High potential; Substantially reduced AUMs, manage for reference state	Moderate potential; continue management for PFC	Highest potential; due to the elimination of livestock-related activity in the Monument	Minor to Moderate potential; continue management for PFC
	Potential to improve playas	Moderate potential; continue management for playas	High potential; due to closed areas and reduced AUMs	Moderate to High potential; seasonal restrictions will benefit playas	Highest potential; due to the elimination of livestock-related activity in the Monument	Moderate potential; seasonal restrictions will benefit playas

Resource	Impact	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Vegetation Resources	Potential to protect intact native plant communities	Moderate potential; current management offers some protection	Moderate to High potential; due to closed areas and reduced AUMs	Moderate to High potential; management actions are more restrictive than Alternative A	Highest potential; due to the elimination of livestock-related activity in the Monument	Moderate to High potential; management actions are more restrictive than Alternative A
Wildlife and Fish	Potential to protect greater sage-grouse habitat *Monument Value	High potential; continued management for sage-grouse habitat provided by GRSG ARMPA	High potential; due to closed areas and reduced AUMs and continued management for sage-grouse habitat provided by GRSG ARMPA	High potential; seasonal restrictions will benefit sage-grouse habitat and continued management for sage-grouse habitat provided by GRSG ARMPA	Highest potential; due to the elimination of livestock-related activity in the Monument and continued management for sage-grouse habitat provided by GRSG ARMPA	High potential; seasonal restrictions and no net increase in livestock-related infrastructure disturbance will benefit sage-grouse, as well as continued management for sage-grouse habitat provided by GRSG ARMPA
Native American Right and Interests	Potential to protect and preserve Native American Rights and Interests *Monument Value	Moderate potential; Tribes have not identified any specific threats under the current management	Moderate potential; due to reduced AUMs	Moderate potential; due to more intensive management of livestock grazing	Highest potential; due to the elimination of livestock-related activity	Moderate potential; due to more intensive management of livestock grazing and reduced AUMs
Cultural Resources	Potential to protect and preserve cultural resources *Monument Value	Moderate potential; no specific threats under the current management	Moderate potential; due to reduced AUMs	Moderate potential; due to more intensive management of livestock grazing	Highest potential; due to the elimination of livestock-related activity	Moderate potential; due to more intensive management of livestock grazing and reduced AUMs
Visual Resources	Potential to be commensurate with designated VRM classes *Monument Value	Moderate potential; continued management for current classes	Moderate potential; continued management for current classes	Moderate potential; continued management for current classes	High potential; due to reduced human impacts	Moderate potential; continued management for current classes

Resource	Impact	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wilderness Study Areas	Potential to enhance characteristics of WSAs  *Monument Value	Low potential; due to continuation of current management	Moderate potential; due to some removal of human impacts within WSA boundaries	Low potential; due to continuation of current management	Highest potential; due to reduced human impacts	Low potential; due to continuation of current management
Lands with Wilderness Characteristics	Potential to enhance wilderness character in lands with wilderness characteristics	Low potential	Moderate potential due to removal/reduction within lands with wilderness characteristics	Low potential yet higher potential than Alternative A with proposed habitat improvements	Highest potential; due to reduced human impacts	Low potential yet higher potential than Alternative A; due to no net increase in livestock-related infrastructure disturbance
Livestock Grazing	Acres unavailable to livestock grazing	1,200	21,000	1,500	275,100	2,200
	AUMs available to livestock grazing *Monument Value	38,187	9,432	37,792	0	19,388
Travel and Transportation	Potential to change travel and transportation use	Low potential; no change from existing levels	Minor potential; due to reduction in livestock-related traffic	Low potential; no change from existing levels	Highest potential; due to elimination of livestock-related traffic	Minor to Moderate potential; no change or very slight reduction in livestock-related traffic
Recreation and Visitor Experience	Potential for user conflict	Low user conflict; no change from existing levels	Minor potential; reduction from existing levels; users may notice some removal of livestock grazing	Low user conflict; no change from existing levels	Lowest potential; due to elimination of livestock grazing	Minor potential; slight reduction from existing levels; users may notice some removal of livestock grazing

Resource	Impact	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Socioeconomics	Potential to impact socioeconomics *Monument Value	Low potential; no change	Moderate potential; due to reduction of AUMs	Low potential; no change	Highest potential; due to elimination of grazing	Minor to Moderate potential but less than Alternative B; due to reduction of AUMs
Climate Change	Percentage of annual U.S. greenhouse gas emissions from livestock	0.004%	0.0009%	0.004%	0%	0.018%



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## **Chapter 3. Affected Environment**

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### **3.1. How to Read this Chapter**

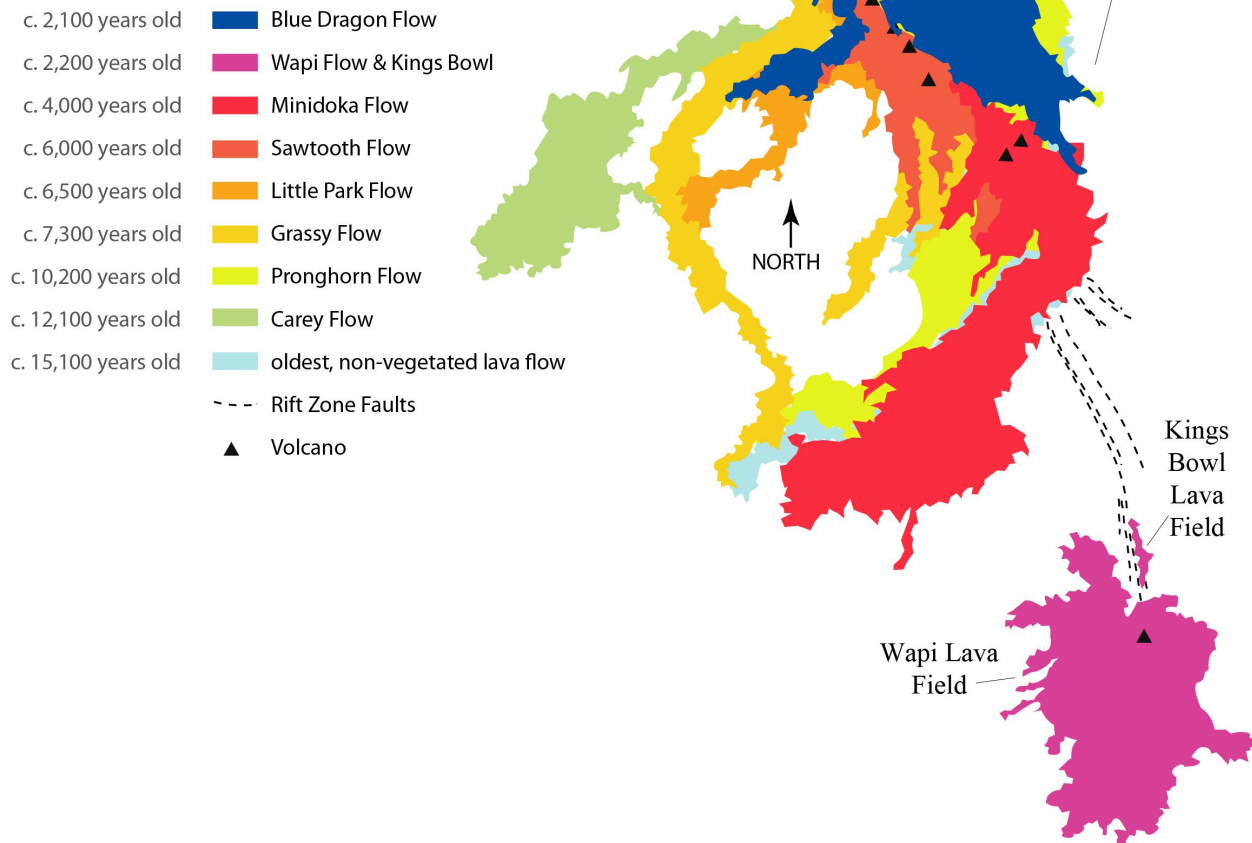
This chapter describes the existing conditions for BLM resource programs, resource uses, special designations, other management areas, and the socioeconomic environment within the Craters of the Moon National Monument Planning Area. Management of resources and resource uses on BLM-managed public land is directed by various laws, regulations, policies, and other requirements. Information in this chapter refers only to BLM lands within the Monument boundary (Figure 1.2, “Planning Area Overview Map” and Figure 1.3, “Detailed Planning Area”).

This chapter describes both the biotic (living) and abiotic (non-living) components that may be affected by the actions described in the alternatives. In addition to describing existing conditions in the planning area, Chapter 3 identifies, where appropriate, management challenges for resources and resource uses on BLM land.

This chapter serves as the baseline against which the impacts of the alternatives, described in Chapter 2, are analyzed and then compared in Chapter 4, Environmental Consequences.

For place locations (streams and communities, for example) please reference Figure 1.2, “Planning Area Overview Map”, Figure 1.3, “Detailed Planning Area”, and Figure 1.4, “Allotment Administration” as well as the lava field and flow map below (Figure 3.1, “Craters of the Moon Eruptions, Lava Flows, and Lava Fields”).

## Craters of the Moon Lava Flows



**Figure 3.1. Craters of the Moon Eruptions, Lava Flows, and Lava Fields**

## 3.2. Resources

### 3.2.1. Soil Resources

Soils within the Monument vary and reflect the differences and interactions between parent material, topography, vegetation, climate, and time. The most significant differences depend on the presence or absence of lava flows and the degree of soil development on volcanic substrates. Soils in this region are volcanic in origin and described by the USDA Natural Resources Conservation Service (NRCS) as being volcanic-ash and mesic soil temperature. Soils on flows less than 13,000 years old are dominated by shallow organic soils called Folists, while older flows have deeper mineral soils which include Entisols, Aridisols, and Mollisols [Vaughn et al., 2011]. Vaughn et al. (2011) reports the difference in soil development on these lava surfaces as related to the availability of loess following volcanic activity, where older flows were subjected to relatively large depositions of loess during and following the most recent glacial activity in the region [Vaughn et al., 2011].

The lava flows, which occupy two-thirds of the Monument, are made up of basalt lava rock. Soils on the younger basalt flows (lava that is visible on the surface) and cinder beds are limited to the initial decomposition of rock and cinders and deposition of windblown loess within crevices, cracks, and fissures. Some plants can establish and grow in little to no soil. As time progresses, soil development continues and more vegetation establishes. Sagebrush steppe, mountain areas, and kipukas within the Monument have deeper, well-formed soils, and include those areas that are visibly vegetated.

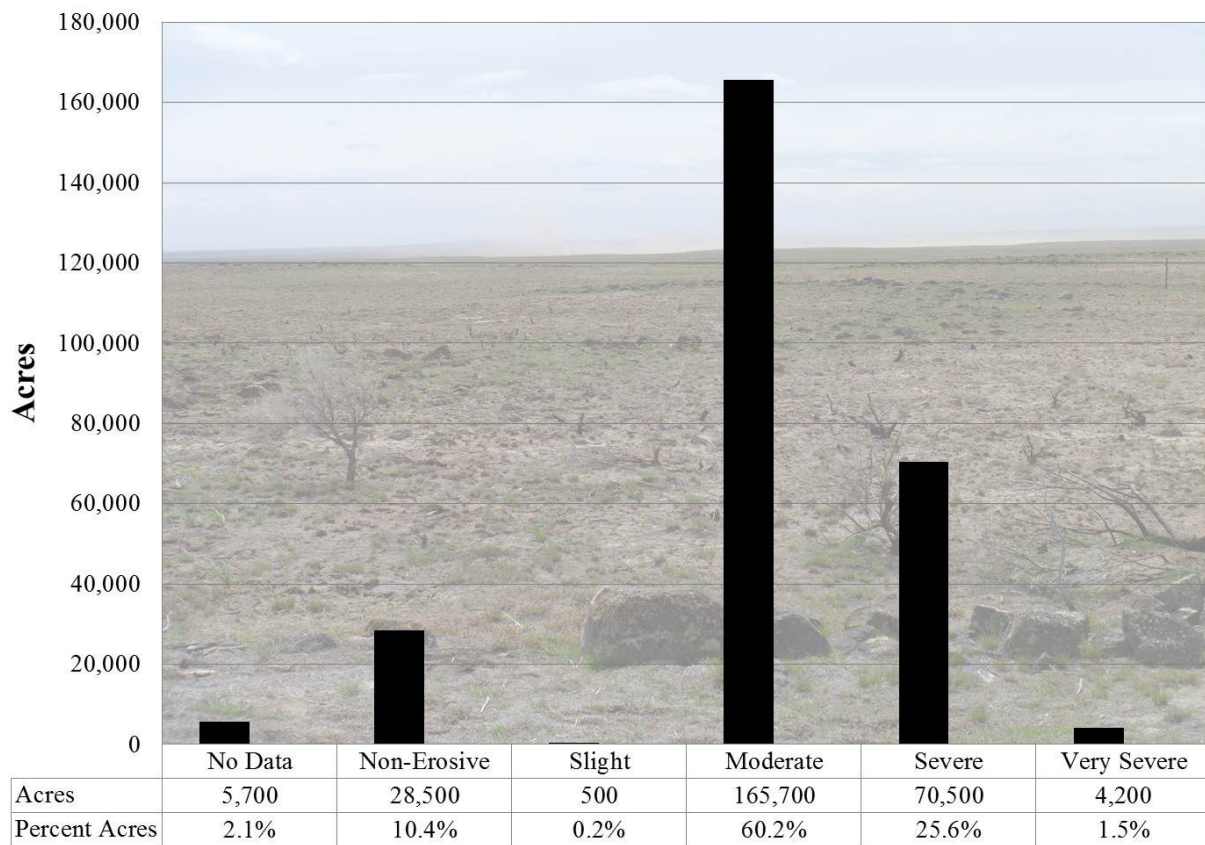
The high desert environment of the Monument results in lighter-colored soils with low organic matter content. Most of the soils in the Monument are silt loam to sandy loam and vary in depth. They are moderately drained to well drained, except where clay horizons are present. Playas are scattered throughout the Monument and exhibit a much slower rate of percolation due to the soil composition. Playas remain ephemerally moist late into the summer months. Soils that are disturbed, not properly vegetated, or located on steep slopes are susceptible to water and wind erosion.

Soil conditions vary throughout the Monument. Areas impacted by concentrated uses, such as OHVs, road travel, range improvements, and sheep bed-grounds exhibit more compaction and erosion than other areas where uses are more distributed or receive less use. Soil compaction reduces the infiltration of water and impedes healthy root system development in plants. This can lead to the establishment or expansion of noxious weeds and invasive plant species and decreases the ability of the site to support desirable vegetation. Typically, these uses are limited to localized areas that vary little from year to year.

Sheep bed grounds and watering areas are specific sites that have been used since grazing began in the Monument in the early 1900s. Not all sites are used every year, but new sites are no longer established, and impacts to these sites are all similar. These areas and range improvement projects are monitored for invasive species.

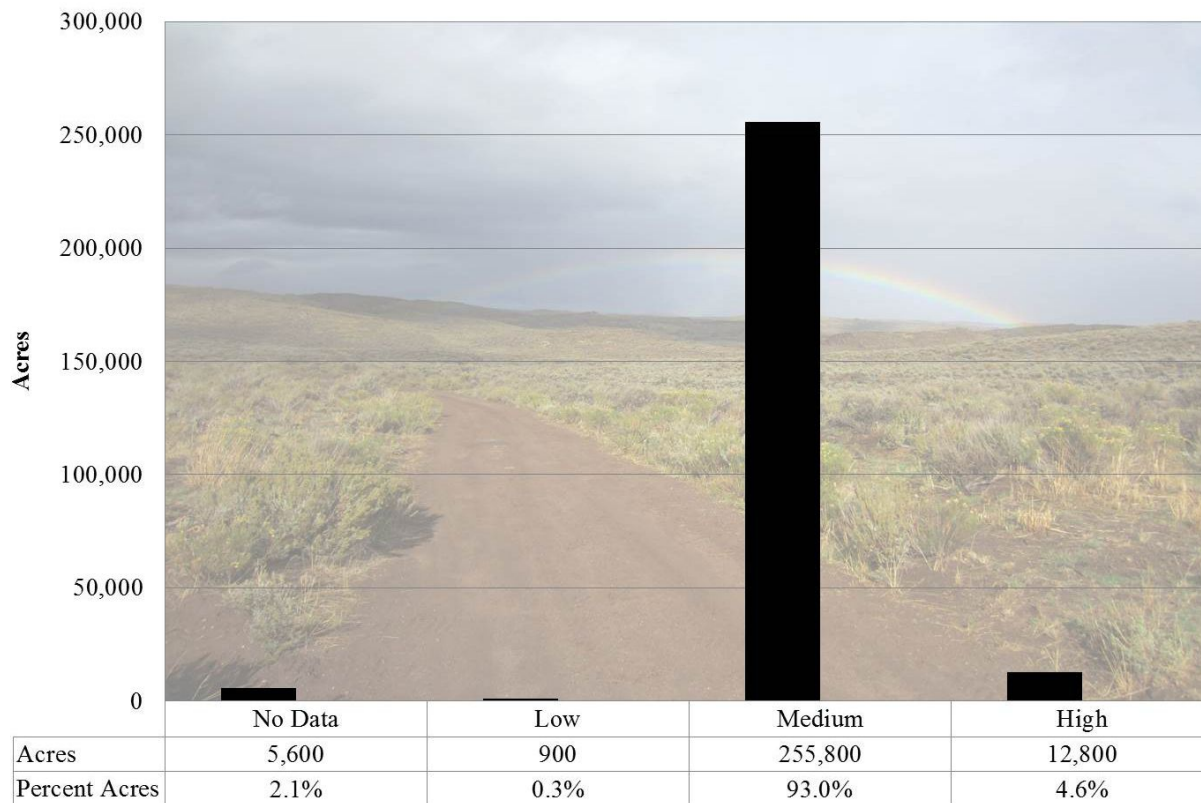
Roads and trails were evaluated during the 2009 Craters of the Moon National Monument and Preserve Comprehensive Travel Management Plan (TMP), and redundant, unused, or unneeded routes were identified for closure and subsequent rehabilitation. To date, several of these routes have been rehabilitated, and soil compaction issues associated with the routes are decreasing. As the rehabilitated areas continue to establish vegetation, soil erosion will diminish as well.

Figure 3.2, “Natural Soil Susceptibility to Wind Erosion” and Figure 3.3, “Natural Soil Susceptibility to Water Erosion” summarize soil susceptibility to wind and water erosion on BLM-managed land within the Monument. The Soil Conservation Service (SCS) (1993) defines wind erosion as detachment, transport, and deposition of soil by wind, and water erosion is the removal of soil by water, such as rainfall or runoff. These processes are accelerated by exposed soil after a wildfire.



**Figure 3.2. Natural Soil Susceptibility to Wind Erosion**

[Natural Resource Conservation Service (NRCS), 2013]



**Figure 3.3. Natural Soil Susceptibility to Water Erosion**

[NRCS, 2013]

### 3.2.2. Water Resources

Surface water resources are limited in the Monument. Stream channels are largely nonexistent within the exposed lava flows, and streams draining from the Pioneer Mountains rapidly become subterranean once they encounter the lava flows. Several small perennial streams and ground water dependent springs occur in the Pioneer Mountains at the north end of the Monument. The BLM has identified 14 surface water sources within the BLM administered portion of the Monument. The majority of these sources are groundwater dependent springs. Portions of two perennial streams do occur within the BLM administered portion of the Monument. Approximately 916 meters of Huff Creek and 66 meters of Copper Creek have been identified and are unavailable to grazing. Very short segments of the Little Wood River and waterways associated with Fish Creek also occur within the Monument boundary; however, these segments appear to be representative of original stream channels, which currently do not support surface water, and are also unavailable to grazing. The active channel for these systems occurs outside the Monument boundary. A portion of Champagne creek also intersects the BLM administered portion of the Monument; however, this segment also does not support surface water and is unavailable to grazing. A small portion of Lava Lake and Huff Lake, approximately two acres each, occur on BLM administered land within the Monument. The presence of surface water at Lava Lake does not appear to be persistent, and there does not appear to be any presence of surface water at Huff lake. The remainder of the surface water sources are groundwater dependent springs. BLM has condition assessments for five of these springs, two are identified as Functional



at Risk, one as Functional at Risk-Upward Trend, and two as Proper Functioning Condition. These assessments were completed in June of 2005. The majority of these springs are available to livestock grazing. The watersheds of Big Cottonwood Creek and Copper Creek span BLM lands immediately north of the Monument and could be indirectly affected by livestock grazing management in the planning area.

Seasonal playa lakes are scattered throughout the sagebrush steppe desert, including the Monument. Many of these playas have been developed by the BLM to create reservoirs, which increases their water-holding capacity and longevity. Numerous caves within the Monument lava flows contain ice deposits, which become melt water during the summer.

### ***Wetlands and Riparian Communities***

Wetland and riparian communities rarely occur in the Monument. The cold-water springs, creeks, lakes, and marshes on lower slopes of the Pioneer Mountains support limited aquatic, wetland, and riparian habitat for numerous plant and animal species. Several species of water-loving (hydrophilic) plants, waterfowl and marsh birds, two frog types, several small mammals, beaver, and moose use these habitats. Many other species use the water sources these areas provide. Wetlands mapped by the USFWS National Wetlands Inventory (NWI) are limited to the northwest corner of the Monument. Most wetlands and wetland habitats are palustrine (non-tidal, inland wetlands dominated by terrestrial and emergent vegetation) and are only seasonally or temporarily flooded.

The Monument is mostly composed of a semiarid sagebrush steppe ecosystem. These areas generally receive 8 to 16 inches of precipitation a year. Given the lack of significant precipitation, snow runoff is the primary source of water in the Monument. The snow runoff accumulates in playas which hold water long enough to allow some specialized aquatic organisms to grow and reproduce, but not long enough for a pond or marsh ecosystem to develop. Most of the playas dry up by July.

### ***Water Rights/Water Use***

The State of Idaho granted the NPS federal reserved water rights within the Monument boundaries in 1998. The priority dates of the rights range from 1924 to 1996, depending on the date when each area was added to the Monument. These rights grant diversions of 54.5-acre feet per year from all surface water and groundwater sources to provide for domestic, irrigation, or industrial use within the Monument [Hurlbutt, 1998]. The rights do not entitle the United States to maintain any specific water table elevation in the Snake River Aquifer beneath the Monument.

The BLM has 337 water right claims on file with the Idaho Department of Water Resources including 18 springs, 192 playa lakes, and 127 reservoirs within the Monument. The claims, primarily used for stock water and wildlife, are for 333.5 total acre-feet per year, and a minimal amount of 0.02 cubic feet per second on each source. Priority dates of the water rights claims start as early as 1926.

Water resources in the Monument are used in a variety of ways: drinking water for the Monument Visitor Center, livestock watering sites, and recreational opportunities like bird watching. Due to the small size and ephemeral nature of playa lakes, there is negligible human recreational use that involves primary or secondary contact with water. However, human use and activities sometimes alter water and associated resources. Playas and reservoirs developed by BLM are an integral part of this semiarid ecosystem, and they often are the only source of water for wildlife and livestock.

The aquatic and wetland habitat supported by Carey Hot Spring has historically been altered by concentrated livestock use and human recreation. In 2004, the perimeter of the spring was fenced to avoid further degradation by livestock and conditions inside the enclosure have improved.

### ***Water Quality***

Steep-sided canyons with high gradient channels and a narrow floodplain characterize the watersheds of Big Cottonwood Creek and Copper Creek. These streams are very similar in geology consisting of sagebrush-covered hillsides in short valleys of sand- and clay-type surface soils. High discharge typically occurs in late spring and early summer due to snowmelt (< 5 cubic feet per second); low discharge occurs in late summer or early fall (<1 - 2 cubic feet per second; [Falter & Freitag, 1996]; [Beneficial Use Reconnaissance Program (BURP), 2007]).

Mining activities in the Big Cottonwood Creek drainage north of the Monument boundary pre-date establishment of the Monument in the 1920s. Outbuildings and tailing materials from the Paymaster Mine remain along the west fork of the creek; however, it is not likely that water quality is currently impacted by past mining activities.

Streamwater quality in Big Cottonwood Creek has been monitored and has generally been found to be good, with no violations of Idaho State standards for temperature [BURP, 2007], dissolved oxygen, and/or turbidity [Falter & Freitag, 1996]. Total dissolved solids content of the water, as indicated by electrical conductivity, has been found to be moderate to low [Falter & Freitag, 1996]; [BURP, 2007]. The stream's waters are carbonate-based, of moderately low alkalinity and carbon dioxide, and neutral to slightly basic pH. Streamwater nutrient concentrations of total phosphorus have been shown to be moderately high with nitrogen limitation indicated, and streamwater concentrations of nitrate nitrogen are high [Falter & Freitag, 1996].

Low to moderate levels of fecal coliform with high fecal streptococcus bacteria in streams suggest animal, rather than human, influence on the stream. Aquatic insect associations are relatively balanced; the community is predominantly comprised of Dipterans, Ephemeropterans, and Plecopterans. Stream bank and channel stability is good, with little indication of eroding or collapsing banks [Falter & Freitag, 1996]; [BURP, 2007].

Big Cottonwood Creek and Copper Creek, and grouped stream orders thereof, are identified as not supporting beneficial uses and are classified as a 303 D impaired stream. Huff Creek, and grouped stream orders thereof, are not classified as a 303 D impaired stream. Several segments of Huff Creek were not assessed for beneficial uses. However, one segment of Huff Creek which was assessed for beneficial uses was found to not be supporting [DEQ, 2014].

### **3.2.3. Vegetation Resources**

Although some of the younger lava flows are devoid of vegetation, there is surprising diversity among plants and plant communities in the Monument (see Appendix E, *Common and Scientific Names of Plant and Animal Species Occurring at Craters of the Moon National Monument & Preserve*). The type and density of vegetation varies widely, depending on the availability of soil. Lava flows and kipukas show a full range of ecological succession - from pioneer plants, such as lichens and mosses on basalt surfaces, to complex plant communities in kipukas and rangelands bordering lava flows. Rough topography of the lava flows creates numerous microsites where soil and water accumulate and can support plants that would normally occur in higher precipitation zones.

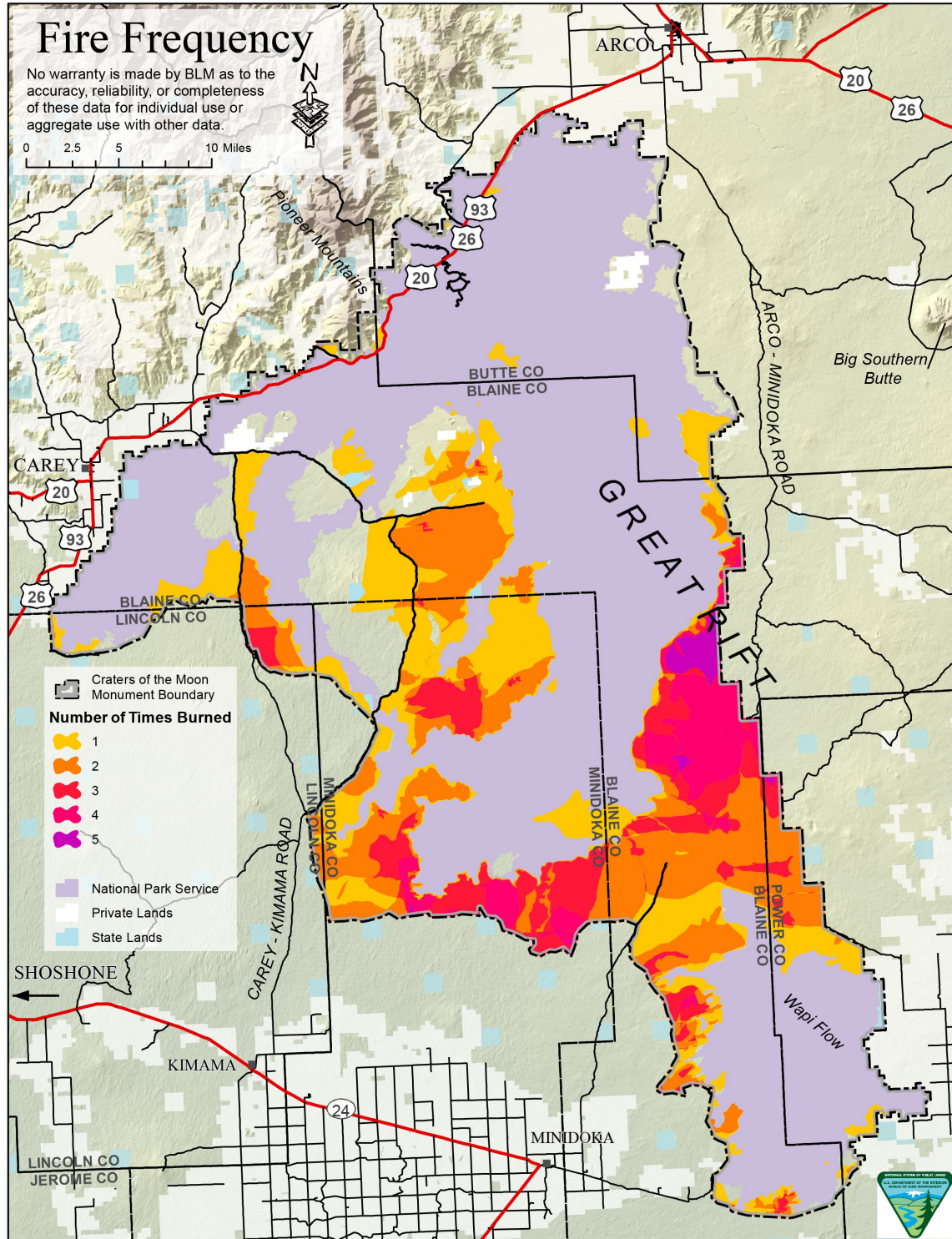
Limber pine stands occur on cinder cones and lava flows in the northern part of the Monument. The transition between limber pine and juniper vegetation communities occurs between Blacktail Butte and the Craters of the Moon National Wilderness Area. This ecotone normally occurs in montane regions and is an unusual feature for the lava flows [USDI BLM, 1980]. Quaking aspen and Douglas-fir stands are found on some north-facing slopes in the northern portion of the Monument. Riparian and wetland habitats are limited to the northern periphery due to geology, topography, and climate of the area.

Early successional plant communities on the cinder cones produce diverse spring wildflower displays. Areas with greater soil development support the sagebrush steppe vegetation that typifies the Snake River Plain. Sagebrush steppe is found on approximately 60% of the Monument and covers the more developed soils of rangelands, kipukas, cinder cones, older lava flows, and the Pioneer Mountain foothills, most of which is in the BLM-managed portion of the Monument. Sagebrush steppe vegetation type was once common throughout the Snake River Plain, as well as in the Intermountain West and Upper Columbia River Basin. However, fire, agriculture, and historical livestock management practices have modified composition and reduced the extent of this vegetation type throughout these regions [Blaisdell, Murray, & McArthur, 1982]; [Whisenant, 1990]; [Bunting et al., 2002]; [Strand & Launchbaugh, 2013].

Some portions of the Monument, such as isolated kipukas on NPS lands, have been infrequently grazed by livestock and have seen little in the way of other human-related disturbances. Consequently, these areas, which are protected by newer, rough lavas, offer some of the best remaining examples of native sagebrush steppe in the Snake River Plain. They are considered Monument values and exemplary of range conditions before European-American settlement and the introduction of domestic livestock. Some of these areas offer a unique opportunity to observe native plant communities that have experienced low anthropogenic disturbance levels, as well as successional processes associated with disturbances, such as fire, and weeds introduced by wildlife, recreation, or airborne means.

### **Fire and Vegetation Management**

Between 1970 and 2015, approximately 310,000 acres have burned in wildfires within the boundary of the expanded Monument, primarily on BLM-administered land. About two-thirds of this acreage has burned two or more times (Figure 3.4, “Fire Frequency in the Monument (1970–2015)”).



**Figure 3.4. Fire Frequency in the Monument (1970–2015)**

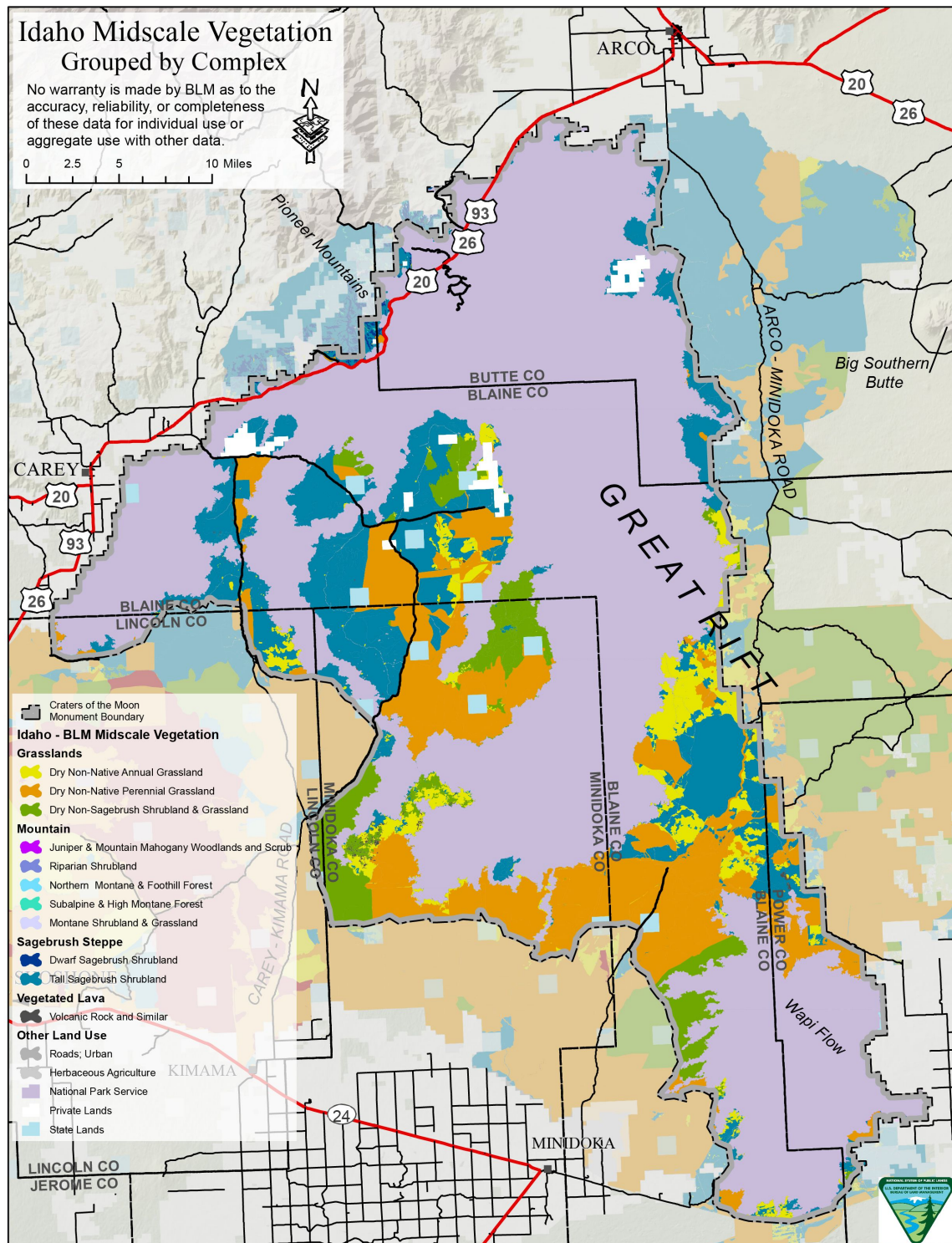
Peak fire years occurred in 1992 (61,000 acres), 1999 (87,000 acres), 2005 (56,000 acres), and 2006 (65,000 acres). Extensive acreages outside of and adjacent to the Monument also burned during this period. About half of Laidlaw Park and Paddelford Flat and nearly all of Little Park have remained unburned in the last decade. Relatively small fires have burned on vegetated lava and in kipukas, notably Little Prairie in 1992 (1,900 acres), Echo Crater in 2000 (600 acres), and most recently the Point Well Fire in 2015 (1,000 acres).

Fire plays a key role in determining the diversity and condition of vegetation communities. Large tracts of sagebrush have been lost due to extensive wildfires, and fires have perpetuated exotic annual grasslands. However, fire also plays an important role in the maintenance of some vegetation types, including aspen and mountain shrub. Please refer to the 2007 MMP, Chapter 2, *Natural Resources, Vegetation, including Special Status Species and Fire Management* (pp. 22–23) for more details about wildland fires in the Monument.

Vegetation in the original Monument and parts of the expanded Monument has been inventoried and mapped through various efforts [Day & Wright, 1985]; [Whipple, 1992]; [Jurs & Sands, 2004]. A 2003 vascular plant inventory effort estimated the presence of more than 600 species within the Monument [Popovich, 2006]. Since the current MMP was published in 2007, NPS has completed an inventory in 2008, estimating about 175 non-vascular plant species [Hutten, 2008].

The most current vegetation map of the Monument was created with the use of Landsat imagery. Data from various vegetation studies, as well as inventory and monitoring points, were used to define spectral signatures detectable from the Landsat satellite. Vegetation inventory and ground-truthing of the map are ongoing; the vegetation map is a dynamic resource. This map, which is relatively broad in scale, is intended to provide a frame of reference for vegetation distribution and diversity within the Monument. The following discussion describes complexes that group and define the various vegetation types illustrated in Figure 3.5, “Existing Vegetation Types in the Monument (2013)”.





**Figure 3.5. Existing Vegetation Types in the Monument (2013)**

## Vegetation Types in the Monument

The Monument is part of the Snake River Plain ecoregion [NatureServe, 2013]. The National Vegetation Classification Standard (NVCS) has been set as the standardized vegetation classification system for BLM land use planning efforts. BLM Policy IM 2013-111 defines the strategies and levels to use for consistent mapping and classification efforts across the BLM. RMP amendments are directed to use Macrogroups to define cover types for general existing vegetation. Table 3.1, “Vegetation Types in the Monument [NatureServe, 2013] and BLM datasets” lists the Macrogroups found in the Monument, as well as their corresponding BLM Midscale description, and a more general vegetation complex grouping. The following vegetation types are found in the Monument:

**Table 3.1. Vegetation Types in the Monument [NatureServe, 2013] and BLM datasets**

Complex	BLM Midscale	Macrogroup
Mountain Shrub	Northern Montane & Foothill Forest	Northern Rocky Mountain Lower Montane & Foothill Forest
	Subalpine & High Montane Forest	Rocky Mountain Subalpine & High Montane Conifer Forest
	Juniper & Mountain Mahogany Woodlands and Scrub	Intermountain Singleleaf Pinyon - Western Juniper Woodland
	Riparian Shrubland	Western North American Montane Wet Meadow & Low Shrubland
	Montane Shrubland & Grassland	Great Plains Mixedgrass Prairie & Shrubland
Sagebrush Steppe	Tall Sagebrush Shrubland	Northern Great Plains Woodland
	Dwarf Sagebrush Shrubland	Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe
Grasslands	Dry Non-Sagebrush Shrubland & Grassland	Great Basin & Intermountain Dwarf Sage Shrubland & Steppe
		Great Basin & Intermountain Dry Shrubland & Grassland
	Dry Non-Native Perennial Grassland	Intermountain Basins Semi-Desert Grassland
	Dry Non-Native Annual Grassland	Introduced & Semi Natural Vegetation
Vegetated Lava	Unconsolidated Materials, Volcanic Rock, Bedrock, Scree, Cliff and Canyon	Introduced & Semi Natural Vegetation
		Intermountain Basins Cliff, Scree & Badland Sparse Vegetation
Other Land Use	Urban	Developed & Urban
	Herbaceous Agriculture	Herbaceous Agricultural Vegetation
	Roads	Roads

### *Mountain Shrub Complex*

The mountain shrub complex occurs at the north end of the Monument in the Pioneer Mountains. This complex covers about 4% (<10,000 acres) of the BLM portions in the Monument, but it includes vastly different and important habitat types that contribute to the diversity of the complex. These areas are typically at the higher ranges of elevation in the Monument, but inclusions are found where adequate moisture or temperature regimes exist, such as in rocky outcrops along the lava edges. Livestock use is usually lower in these areas than in the other complexes across the Monument, due in part to the scattered nature of this complex, and limited accessibility when compared to the more widespread complexes. However, the mountain shrub complex is important to wildlife, and is used as part of the landscape by various species.

Four vegetation types are included in this complex. The Northern Montane & Foothill Forest and Subalpine & High Montane Forest types are found on relatively steep, north-facing slopes of older cinder cones. The Riparian Shrubland type, which can be found along Little Cottonwood Creek, is characterized by dense woody vegetation such as black cottonwood, chokecherry, willow, alder, and a dense layer of tall forbs near permanent watercourses. The Montane Shrubland & Grassland vegetation type includes communities dominated by mountain big sagebrush, low sagebrush, and mountain snowberry that occupy slopes and ridges of the Pioneer Mountains.

### ***Sagebrush Steppe Complex***

Sagebrush steppe includes all areas where adequate soil deposition or development has occurred to allow sagebrush taxa and associated shrubs with a bunchgrass understory to dominate. The sagebrush steppe complex and associated midscale classifications comprise 35% of BLM portions of the Monument (97,000 acres). Due to the drastic reduction of sagebrush steppe in southern Idaho by cultivation, fire, and weed invasion [Hironaka, Fosberg, & Winward, 1983], some of the sagebrush communities in the Monument are the best remaining examples of this vegetation type on the Snake River Plain, and considered as Monument values.

The sagebrush steppe appears to be a monotonous landscape; however, there is a remarkable diversity of plant and community types. Many factors influence the diversity, density, cover, distribution, and health of this high desert sagebrush steppe. Factors include differences in soil depth and development, precipitation gradient (ranging from 8 to 14 inches), elevation gradient (ranging from 4,000 to 7,500 feet between the southern and northern ends of the Monument), historical and current land management, invasive species, and fire frequency. In turn, vegetation structure and composition influence the ability of the community to resist invasive species infestation, as well as recover from fire.

Sagebrush steppe vegetation in the Monument is dominated by four species of sagebrush. Three subspecies of big sagebrush include mountain big sagebrush, basin big sagebrush, and Wyoming big sagebrush and threetip sagebrush is the fourth species. Midscale classifications include Tall Sagebrush Shrubland and Dwarf Sagebrush Shrubland, but can be further broken down into Mid- to High-Elevation Sagebrush Steppe and Low-Elevation Sagebrush Steppe because of elevation and precipitation gradients.

The Mid- to High-Elevation Sagebrush Steppe vegetation type is generally defined by the presence of mountain big sagebrush and antelope bitterbrush, which are found in the northern end of the Monument and occur in higher-elevations that are colder and receive more precipitation. Low sagebrush is also found in this vegetation type, occurring as a mosaic within mountain big sagebrush.

The Low-Elevation Sagebrush Steppe vegetation type is defined by basin big sagebrush, Wyoming big sagebrush, and threetip sagebrush, though these may overlap to some extent with the mid-elevations. Basin and Wyoming big sagebrush are adapted to the hot, seasonally dry conditions of the Snake River Plain and can be found intermixed. Basin big sagebrush communities occur in pockets of deeper, more fertile soils. Wyoming big sagebrush communities tend to be found in shallower soils.

Threetip sagebrush is widespread throughout the Monument, particularly in areas that burned within the last 20 years. Threetip sagebrush is the only sagebrush found in the Monument that re-sprouts following fire. The Low- and Mid- to High-Elevation Sagebrush Steppe vegetation



types contain other common shrubs such as antelope bitterbrush, rubber rabbitbrush, and green rabbitbrush.

Understory components in the sagebrush steppe complex vary widely in type and abundance, but common species include Sandberg bluegrass, Idaho fescue, needle-grasses, bluebunch wheatgrass, and the exotic annual cheatgrass. Forbs such as buckwheats, arrowleaf balsamroot, lupine, phlox, and milkvetches are also commonly found growing in these vegetation types. Both diversity and abundance of herbaceous plants increase with rising elevation and moisture throughout the Monument.

The reduction of large tracts of sagebrush through increased size and frequency of wildfires is a concern in the area. Less obvious is the loss of native understory plants, particularly native bunchgrasses that are valuable components to the ecosystem. Plants such as bluebunch wheatgrass and Idaho fescue may not be resilient under conditions of closed shrub communities, frequent fire regimes, cheatgrass invasion, altered climate or site conditions, or excessive grazing. The reduction in these native species by one factor increases their susceptibility to other factors. Once native understory species are excluded, they are very difficult to reestablish [Hironaka et al., 1983].

The variation of sagebrush steppe communities influences the multiple values and uses of this landscape in the Monument. These areas are valued as crucial winter range habitat for mule deer and pronghorn, essential habitat for sagebrush-obligate wildlife like sage-grouse, important watersheds, sources of livestock forage, and for recreational use. Conditions of the sagebrush steppe community in the Monument vary greatly, primarily due to relative isolation and past and present land uses.

The Monument contains more than 500 kipukas, many of which contain relatively undisturbed native sagebrush steppe communities. Fire, livestock grazing, recreation, or cheatgrass invasion have altered some of the kipukas; however, other kipukas in the Monument have been protected from access and buffered by rough lavas. The abundance and condition of resources within most of these kipukas is undocumented and relatively unknown. Nevertheless, those kipukas that have been documented and studied make it clear that these unique islands of native vegetation are important rangeland and scientific benchmarks [Henderson & Murie, 1958]; [Yingst & Handy, 1961]; [Tisdale, Hironaka, & Fosberg, 1965]; [Caicco & Wellner, 1983a, 1983b, 1983c].

Laidlaw Park, Paddelford Flat, Larkspur Park, and Little Park are kipukas, but are referred to as “parks” due to their larger size, accessibility, and land uses. There is road access to and within these parks, and livestock grazing is a current and historical use. All four parks contain the sagebrush steppe vegetation type, as well as areas dominated by annual and perennial grasslands. The abundance of native species and the quality of these sagebrush steppe communities depends mainly on management practices and cumulative effects of environmental responses. For example, the northern parts of Laidlaw Park retain sufficient native understory and sagebrush. Conversely, historical grazing practices, frequent wildfires, Aroga moth infestations, cheatgrass invasion, and noxious weeds have negatively affected the southern portions of Laidlaw Park. In addition, the southern part of Laidlaw Park receives less rainfall than the northern part, making it less resilient to disturbance [Jurs & Sands, 2004].

### ***Grasslands Complex***

The Dry Non-Native Perennial Grassland and Dry Non-Sagebrush Shrubland & Grassland vegetation type is dominated by native or introduced perennial grasses. The grasslands complex covers 60% of the BLM portions of the Monument (166,000 acres) and covers a wide range of

precipitation and elevation. Historically, Dry Non-Sagebrush Shrubland & Grasslands were part of the sagebrush steppe complex and formed because of disturbance, primarily through wildfire. Shrubs would eventually reestablish in perennial grasslands if they remain unburned for several decades. In most cases, fire is the main cause of shrub removal. Some shrubs such as threetip sagebrush, rubber rabbitbrush, and green rabbitbrush are able to re-sprout, and mountain big sagebrush is able to reestablish more rapidly (roughly 10 years). However, Wyoming and basin big sagebrush must regenerate from seed and can be slow to reestablish after fire.

Dry Non-Native Perennial Grasslands typically lack a shrub component, such as sagebrush, and possibly have reduced forb diversity. Established, non-native perennial seedings function to reduce soil movement from both water and wind erosion, and limit invasive species expansion and establishment. They are resilient to disturbances, requiring little input to maintain a stable system following natural disturbance events like wildfires, and are more able to withstand repeat moderate to heavy grazing than mid-size native perennial bunchgrasses. Crested wheatgrass is a key component of Dry Non-Native Perennial Grass communities in the Monument. Peak production of crested wheatgrass typically occurs in April-June, tapering off in July. An initial leaf height of at least 4 inches prior to grazing is recommended to sustain productivity and vigor of grazed plants [Meays, Laliberte, & Doescher, 2000].

The Dry Non-Native Annual Grassland vegetation type is the result of altered disturbance regimes, such as soil surface disturbance or frequent fires in areas with longer natural fire return intervals. Cheatgrass is the primary component and is an exotic species that perpetuates short fire-return intervals and conditions that maintain its dominance.

In many cases, microsite conditions have often been altered to the extent that native grasses are unable to effectively compete with cheatgrass and noxious weeds. Under these conditions, burned areas are revegetated by seeding perennial vegetation to prevent the establishment of annual grasslands. In areas where altered site conditions and high competition from exotic species exist, select cultivars of introduced and native perennial grasses and forbs have been used to rehabilitate burned areas. Some of the species seeded in rehabilitated areas are crested or Siberian wheatgrass, Snake River wheatgrass, tall wheatgrass, bluebunch wheatgrass, Sherman's big bluegrass, and Sandberg bluegrass. Forbs such as blue flax, sainfoin, scarlet globemallow, and alfalfa have also been seeded. Exclusively native plant seedings have also been completed in Wilderness Study Areas. Both the NPS and BLM encourage the use of native species for restoration and rehabilitation efforts.

### ***Vegetated Lava Complex***

This system is limited to basalt lava, and cinder cones or fields. Scattered occurrences of buckwheats, limber pine, and juniper may be present.

Exposed lava flows are the newest lava flows and are mostly devoid of vascular plants; however, lichens and mosses are frequently present. Vegetated lava is defined as lava fields with greater than 5% total vegetative cover, with plants occurring as islands, pockets, or clustered individuals in the lava flow. This complex covers less than 1% of the BLM portions of the Monument (roughly 1,100 acres). The vegetated lava complex mainly consists of early successional and adaptable plants that grow in limited soil that blows into the cracks and fractures on young basalt rock.

The type of lava and the amount of soil determine the type and density of vegetation. Penstemon and sticky cinquefoil grow in shallow soils, while desert sweet, rockspirea, and Lewis' mock orange are present in deeper crevices. Trees, such as limber pine in the north end of the Monument

and juniper in the south end, also grow in crevices and cracks where sufficient moisture is funneled and retained. These trees may grow as scattered individuals or as small woodlands. Antelope bitterbrush, rabbitbrush, and sagebrush can also be found (up to 15% of vegetative cover) where more soil development or deposition has occurred.

### **Vegetation Condition**

Each of the aforementioned vegetation complexes is represented by a multitude of Ecological Sites in varying conditions. Ecological Site Descriptions (ESD) produced by the NRCS characterize these Ecological Sites and they provide estimates of the plant community composition that would be typical for a particular soil type, elevation, slope, and aspect on the landscape. They describe the reference state if there were no disturbances, such as excessive grazing or fires, as well as multiple states that could occur under various disturbance regimes.

Monitoring data and various assessments (Standards and Guidelines Assessments, HAF assessments, Jurs and Sands (2004)) have sought to characterize the condition of the plant communities in relation to these ESDs. In 2004, a study was published to establish the current condition and provide management recommendations for the vegetation communities in Laidlaw Park, Little Park, and Paddelford Flat, the three largest kipukas in the Monument [Jurs and Sands, 2004]. The conditions described in this report mirror those that are used in the ESD State and Transition Models. In the State and Transition Models, vegetation communities are described by the degree of departure from the reference state. The plant community of the Ecological Site is able to withstand a certain level of disturbance and maintain its stable state, recovering from a fire or withstanding grazing pressure. If a threshold of disturbance level is crossed, then the community cannot return to reference state without significant inputs, such as seeding.

For comparison, the Jurs and Sands report uses biotic integrity ratings of “Good,” “Fair,” and “Poor.” “Good” was defined as, “the plant community has the capacity to sustain its natural biological diversity (plants and animals) and values within the context of normal environmental stress (fire, drought, flood, herbivory, etc.).” “Fair” was defined as, “the community’s biological diversity and capacity has been diminished, it is vulnerable to further degradation, but it can return to a higher level of organization if environmental stressors are low and infrequent enough to allow recovery.” “Poor” was defined as, “the community’s biological diversity and capacity has been seriously degraded and it has crossed a threshold. It cannot return to higher levels of organization within any reasonable time frame without substantial external inputs (i.e. seeding).”

The basis for both sets of ratings are similar, as well as the means of maintaining the ratings or causing progression towards the reference community or retrogression towards another stable state. In the State and Transition models, State 1A is the reference community, which would be comparable to Good biotic integrity. These communities can sustain themselves given proper grazing and fire management.

State 1B (sometimes it is State 1.2 or other designation, but for simplicity, comparable states will be referred to as 1B in this document) in the State and Transition models is generally a plant community that has maintained its shrub component, but lost some of its herbaceous component, generally due to improper grazing and a lack of fire. This state is comparable to a Fair biotic integrity rating, as it still maintains the components for natural recovery to reference state (State 1A or Good) with proper livestock management, such as light utilization rates and periodic rest.

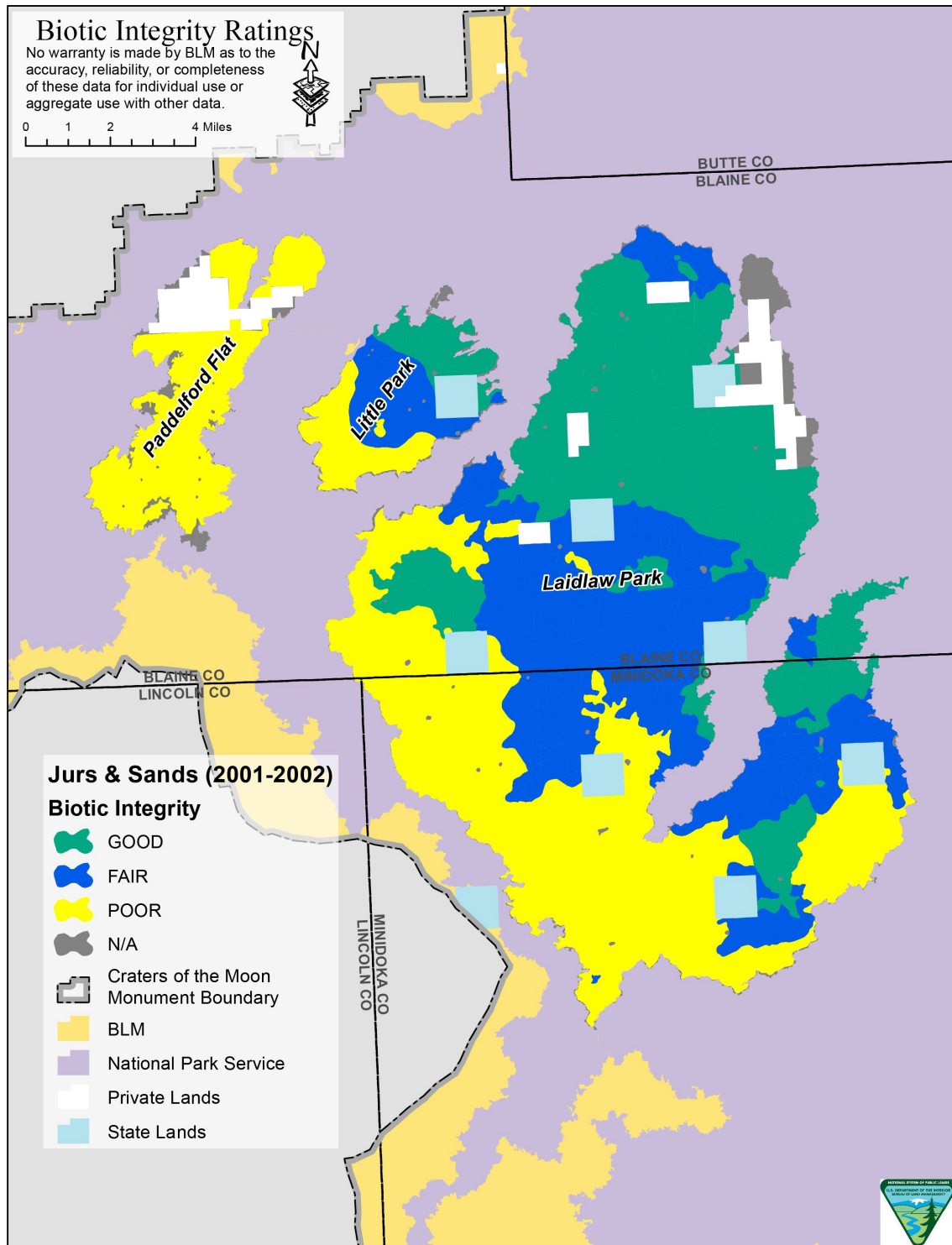
State 1C in the State and Transition models is generally brought about by wildfire in a reference community. It generally has an intact herbaceous component, but some species, such as Thurber’s

needlegrass may be reduced and cheatgrass may invade due to the wildfire disturbance. The Jurs and Sands report did not have a comparable category to the State and Transition models for this category. The report designated them as Good, Fair, or Poor based on the aforementioned criteria.

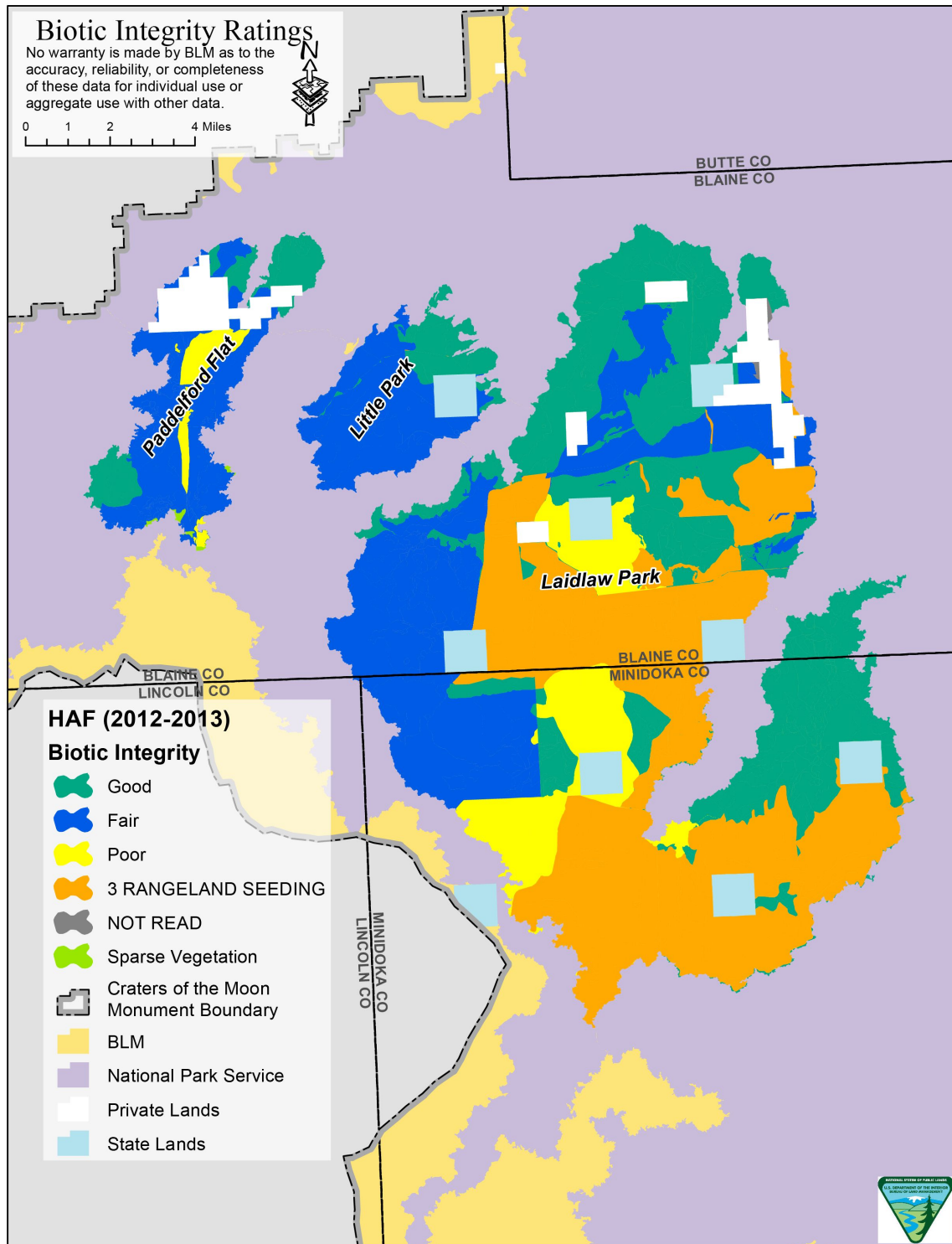
State 2 in the State and Transition models is comparable to the Poor biotic integrity rating. These sites have crossed a threshold and are generally dominated by cheatgrass and Sandberg bluegrass. Significant inputs would be necessary to improve the biotic integrity of these sites. They cannot recover to reference state without seeding.

The Jurs and Sands report assessed seeded areas as it assessed native areas, but the State and Transition models allow for another stable state in which an area is seeded with native or non-native cultivars.

The Jurs and Sands study was conducted during the fall of 2001 and spring of 2002. 2001 was a severe drought year, and 2002 was slightly below average, which may explain some of the discrepancies in the following maps. Fall data collection can result in missing some of the herbaceous components of a plant community, and many forbs do not express themselves fully during a drought. Early season sampling can make plant identification difficult, as well. Both limitations were noted in the Jurs and Sands report. The same limitations apply to the HAF methodology (i.e. seasonal and/or drought data collection limitations), however the HAF is designed to sample for sage-grouse habitat at the time the habitat is used. The following maps depict the biotic integrity ratings presented by the Jurs and Sands report with a comparison to those comparable ratings from data collected in 2012 and 2013.



**Figure 3.6. Biotic Integrity (Jurs and Sands Data, 2001–2002)**



**Figure 3.7. Biotic Integrity (Habitat Assessment Framework Data, 2012–2013)**

## Nonvascular Plants

A non-vascular plant inventory completed in 2008 found about 70 moss, 10 liverwort, and 95 lichen species in the Monument [Hutten, 2008]. These organisms, also known as biological soil crusts, occur to some extent in every vegetation type in the Monument and are commonly observed on exposed lava. Non-vascular plants perform a number of ecologically important functions; they actively decompose detritus, break down rock, and add structure and nutrients to the soil. They are important components of the functioning ecosystem and serve as environmental quality indicators.

## Noxious Weeds and Invasive Plant Species

Eleven species of weeds designated as noxious by Idaho State Law have been identified in the Monument: spotted knapweed, diffuse knapweed, Russian knapweed, rush skeletonweed, leafy spurge, Canada thistle, musk thistle, Scotch thistle, Dalmatian toadflax, Dyer's woad and field bindweed [State of Idaho, 2001]. Disturbed areas such as road rights-of-ways, intensively grazed areas, and burns are particularly susceptible to invasion by exotics; consequently, most of the noxious weeds are found specifically in these areas.

**Table 3.2. Noxious Weeds and Invasive Plant Species in Craters of the Moon**

Common Name	Scientific Name	Statewide List Type
Russian knapweed	<i>Acroptilon repens</i>	Control
Musk thistle	<i>Carduus nutans</i>	Control
Diffuse knapweed	<i>Centaurea diffusa</i>	Containment
Spotted knapweed	<i>Centaurea stoebe</i>	Containment
Rush skeletonweed	<i>Chondrilla juncea</i>	Containment
Canada thistle	<i>Cirsium arvense</i>	Containment
Field bindweed	<i>Convolvulus arvensis</i>	Containment
Leafy spurge	<i>Euphorbia esula</i>	Containment
Dyer's woad	<i>Isatis tinctoria</i>	Control
Dalmatian toadflax	<i>Linaria dalmatica dalmatica</i>	Containment
Scotch thistle	<i>Onopordum acanthium</i>	Containment

### Note

“Control” means to obtain control through any or all of the following methods: prevention, rehabilitation, eradication, or modified treatments.

“Containment” means halting the spread of a weed infestation beyond specified boundaries. [Idaho Code Title 22 Agriculture and Horticulture, Chapter 24 Noxious Weeds, Idaho State Department of Agriculture]

Spotted knapweed and diffuse knapweed have been documented extensively along U.S. Highway 20/26/93 through the northern extent of the Monument. More than 200 infestations of knapweed occur along the highway within Monument boundaries. NPS mapped and treated these locations in 2001 and 2003. Spotted and diffuse knapweeds have also been documented and treated in Paddelford Flat and Laidlaw Park, along the west and east edges of the Monument, respectively.

Rush skeletonweed has been reported in various locations in Laidlaw Park and the west side of the Monument; it is also found in the vicinity of Bear Trap Cave and Kings Bowl on the east side of the Monument. Many observations of this species have not been officially documented, but incidental observations suggest that it is much more widespread than any current mapping effort

shows. For instance, from data collected for habitat assessments in 2012 and 2013, 24% of transects had at least one occurrence of rush skeletonweed. This weed also takes advantage of disturbed soil and spreads primarily by seed.

Leafy spurge has been documented in the west part of the Monument as small, scattered sites within the sagebrush steppe and vegetated lava vegetation types (Carey Lava Field). It has also been recently documented in the group campsite north of highway 20/26/93. Large infestations are known to exist along the west edge of the Monument near Monument Butte, Sand Butte, and the town of Carey. These large infestations have increased potential for further introduction and spread onto the Monument by way of birds, deer, livestock, and vehicles. BLM is continuing a control program specifically developed to address infestations on lava-based terrain.

Thistles are scattered throughout the Monument. Nearly 100 total locales have been documented for all three noxious thistles.

Dyer's woad has been found and treated near Brigham Point. Other scattered occurrences have been treated along the east and west sides of the Wapi Flow. Dyer's woad is known to occur across the Wapi Flow.

Both BLM and NPS have initiated integrated noxious weed programs. Efforts to control these species are in effect, including the use of mechanical and spray techniques, as well as limited use of biological control agents. The priority species discussed have been targeted specifically for mapping, treatment, and prevention programs. Education and public awareness are emphasized by both agencies. Involvement in Cooperative Weed Management Areas has resulted in strong community commitment and cost-effective management of noxious weeds.

Other invasive, exotic species, such as cheatgrass, are as much of a concern as state-listed noxious weeds. Cheatgrass, a common and widespread invader throughout the West, is extremely competitive and readily invades and dominates disturbed land. It can be a component of undisturbed or otherwise healthy sagebrush. For example, cheatgrass has been documented in several kipukas that lack a history of common human disturbances such as livestock grazing. This annual grass out-competes native vegetation and perpetuates a frequent fire regime, which further discourages the regrowth of native species and encourages more cheatgrass. This has been a key management concern for BLM and has driven the development of more effective disturbed land rehabilitation and restoration techniques. Approximately 28,000 acres of BLM-managed lands in the Monument have cheatgrass and other invasive annuals as a dominant component, or greater than 50% composition. As soils types change with increased precipitation and elevation and decreased temperature, the amount of cheatgrass present decreases.

BLM and NPS have implemented nationwide policies against invasive and harmful exotic species. All the species mentioned in this discussion have been targeted for eradication, containment, or control.

The dispersal and spread of noxious weeds can happen through a variety of means, including the visitor use for resources offered in the Monument (e.g. hunting, camping, and OHV use), wildfires, as well as natural transportation means, such as wind, birds, and other wildlife. Livestock can contribute to the dispersal of weed seeds and materials through feed consumption, and seeds can be transported by livestock coats and also by vehicles and equipment related to livestock grazing. Certified weed-free hay is required on all BLM lands (USDI BLM, 2011).

## **Special Status Plants**



Special status plants are those federally listed under the ESA and species recognized by Idaho and BLM as sensitive. All species identified as sensitive by BLM must be managed proactively by BLM to protect these species, and NPS strives to manage its land to protect any federally listed, state-listed, or special status species. The most current list will always be the applicable special status species list.

The Idaho Native Plant Society and Idaho Department of Fish and Game (IDFG) Natural Heritage Program (INHP) meet annually with State and Federal agencies to review the status of plants considered to be globally, state, or locally rare. The resulting list is used to determine which species lack federal protection under the ESA, require, or would benefit from protection at a local or regional level.

Two BLM sensitive plants are known to occur within the Monument: obscure phacelia and Picabo milkvetch. Areas within and surrounding the Monument have been systematically surveyed for both obscure phacelia and Picabo milkvetch, and population information is documented in status and monitoring reports [Moseley & Popovich, 1995]; [Murphy, 2002].

Obscure phacelia is one of Idaho's rarest plants, with only six occurrences (population areas) known statewide. Obscure phacelia is an erect-stemmed annual that grows primarily on moderately steep, north and east facing slopes of volcanic-based mountains and buttes at approximately 5,390 to 6,200 feet elevation. It often grows in dark-colored, well-drained silt-loams with varying amounts of sand, gravel, cobble, stone, and boulder colluvium intermixed. Most microsites are not cindery or extremely gravelly. Soils are derived from and overlay volcanic substrates. Areas supporting obscure phacelia usually lack litter accumulation, are always relatively loose or scarified (due to animal and erosion disturbance), and lack dense perennial vegetation. The soil depth varies from shallow (over boulders) to moderately deep. The range of obscure phacelia in Idaho is from the eastern side of the Great Rift of the Upper Snake River Plain to the foothills of the Pioneer Mountains [Murphy, 1995].

Picabo milkvetch is narrowly endemic to stable, sandy soils in the north-central portion of the eastern Snake River Plain, near the foothills of the Pioneer Mountains and Picabo Hills. Picabo milkvetch is frequently found in open grassy areas (often in previously burned patches within sagebrush shrubland) and is rarely found in the understory of late-seral sagebrush stands [Moseley & Popovich, 1995]; [Alexander, Liston, & Popovich, 2004].

**Table 3.3. Special Status Plants in the Monument**

Common Name	Scientific Name	Type
Obscure phacelia	<i>Phacelia inconspicua</i>	2
Picabo milkvetch	<i>Astragalus oniciformis</i>	3

### Note

*Type 2* — Species that are imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction.

*Type 3* — Globally rare, very rare in Idaho, or uncommon but not imperiled, with moderate endangerment factors.

*Type 4* — Generally rare in Idaho with small populations or localized distribution and currently have low threat levels.

### 3.2.4. Wildlife and Fish, Including Special Status Species

During a single year, about 200 species of birds, 60 mammals, ten reptiles, and at least three types of amphibians occupy the Monument (Appendix E, *Common and Scientific Names of Plant and Animal Species Occurring at Craters of the Moon National Monument & Preserve*). Late 1960s surveys identified more than 2,000 species of insects in a very small portion of the northernmost part of the Monument [Horning & Barr, 1970].

#### *Wildlife and Fish Habitats and Common Monument Animal Species*

Sagebrush steppe communities comprise much of the wildlife habitat within the Monument. Numerous species are found in sagebrush habitats [Braun, Baker, Eng, Gashwiler, & Schroeder, 1976]; [Trimble, 1989]. Some of these are sagebrush obligates (restricted to sagebrush habitats during breeding season or year-round) or near obligates (occurring in both sagebrush and grassland habitats [Paige & Ritter, 1999]. Sagebrush obligates or associates that occur in the Monument include the sagebrush sparrow, Brewer's sparrow, sage thrasher, sage-grouse, pygmy rabbit, sagebrush vole, and sagebrush lizard.

Sagebrush and the native perennial grasses and forbs of the sagebrush steppe are important sources of food and cover for wildlife [Dealy, Leckenby, & Concannon, 1981]. During winter, the evergreen foliage of sagebrush often provides the only available green vegetation, and its protein level and digestibility are higher than that of most other shrubs and grasses [Peterson, 1995]. Pronghorn, pygmy rabbits, and sage-grouse may exclusively eat sagebrush in winter, and it also becomes a major portion of mule deer and elk diets. Taller sagebrush provides cover for mule deer and sage-grouse [Dealy et al., 1981], and the crowns of sagebrush break up hard-packed snow, making it easier for animals to forage on the grasses beneath [Peterson, 1995].

Throughout the rest of the year, sagebrush provides food for pygmy rabbits and sage-grouse; protective cover for fawns, calves, rabbits, and grouse broods; and nesting sites for many shrub-nesting birds. The sage thrasher, Brewer's sparrow, sagebrush sparrow, and sage-grouse most frequently nest in or beneath sagebrush.

The Monument encompasses some lower slopes of the Pioneer Mountains, which contain both perennial and ephemeral springs. Several of these springs feed small creeks and marshes. A number of species of waterfowl and marsh birds, two frog species, several small mammals, beaver, moose, and several other species use these habitats exclusively. Numerous species of birds use these areas as primary habitat.

Inland redband trout, a subspecies of rainbow trout, may also be present in the isolated cold-water creeks just north of the Monument. Current range-wide abundance of redband trout is unknown; however, resident populations of the species persist at some level in all major areas of their historical distribution in Idaho [IDFG, 2005].

Fairy and tadpole shrimp, two types of freshwater crustacean, can be found in almost every seasonal water pool [Bratton, 1990] in more arid regions of the Monument. Fairy shrimp serve as a valuable food source for migratory waterfowl that use playas as resting areas along their long trek north in spring and early summer.

The Monument contains some scattered stands of trees, including riparian stands of black cottonwood, willows, alders, and quaking aspen; upland stands of quaking aspen or Douglas fir; and lava- or cinder-based stands of limber pine and junipers. These forested sites are used

by more than 110 species of birds, at least four species of reptiles, and at least 37 mammals. Migrant forest birds are highly selective of stopover habitat [Kerlinger, 1995], and these forest stands are important to birds traveling from the Northern Rocky Mountains. Many resident species, including Clark's nutcracker, chickadees, nuthatches, woodpeckers, and others, use them exclusively. Forested sites also provide critical thermal cover for deer, elk, and moose in the foothills of the Pioneer Mountains [Griffith, 1983].

Extensive lava flows serve as habitat for numerous animal species. At least seven species of bats, several species of rodents, and several species of cave invertebrates use lava tubes and flows in the Monument. The flow surfaces are also used by many species of vertebrates and invertebrates, and several species are dependent on the lava structures. Species such as pika, woodrats, skinks, and rock wrens are found primarily on the rock surfaces. Several snake and bat species are dependent on cavities in the lava for hibernation sites.

Subspecies of the Great Basin pocket mouse, the pika, and the yellow-pine chipmunk are endemic to the lavas of the Great Rift. Darker fur characterizes these subspecies, which may be an adaptation to the black lava rock. Pikas are known primarily as residents of high-elevation alpine regions, and those living on the Craters of the Moon Lava Field occupy lower elevations and the highest mean temperatures within the species' range [Beever, 2002].

Several species of birds are also dependent on the lava structures. The Monument has a large population of rock wrens that nest almost exclusively on basalt formations. Many cavity-nesting species nest in rock cavities on the flows. Chickadees and swallows are typically associated with woodlands but will use rock crevices when these features occur near limber pine or juniper stands. Mountain bluebirds and violet-green swallows nest primarily in tree cavities but are known to use rock crevices for nesting. Both species have been documented nesting in crevices and bubbles in flow surfaces in the Monument [Rich, 1984].

Both western and mountain bluebirds have experienced major range-wide declines as result of habitat loss and competition from introduced European starlings. Bluebirds nest in high densities in the north part of the Monument, but are seen far less frequently in southern areas, where substantial flocks of starlings now breed.

Numerous bird species, such as sagebrush sparrows, sage thrashers, and long-billed curlews are protected under the Migratory Bird Treaty Act (USC Title 16, Chapter 7, Subchapter II; Appendix C) and have been documented in the Monument, occupying all habitat types. The migrant patterns include permanent residents, summer residents, migrants only using resting areas a few days a year, and winter-only residents.

Reptiles in the Monument also occupy a wide range of habitats. Ten species of reptiles have been identified in the Monument, including five snakes and five lizards. Several hibernating sites for snakes have been identified in the Monument [Lee, 2002]. These hibernacula may contain animals from several square miles of summer habitat both inside and outside the Monument. Garter snakes and rubber boas are predominantly riparian species, and skinks and gopher snakes usually use rocky habitats with sparse vegetation. Night snakes may occupy the area but are rare and difficult to survey [Peterson, 2003].

Two frog species occur in the Monument, Boreal chorus frog and Pacific tree frog. Two toad species may exist in the Monument as well. One, the Great Basin spadefoot toad, has been detected only once in recent inventory work, but it can remain dormant for several years and is

not readily detected while in burrows. Western toads have not been detected in surveys since 1987; they may have been locally extirpated.

Six species of large mammals are known to inhabit the Monument: mule deer, elk, pronghorn, moose, cougar, and black bear. Most are widespread throughout the Snake River Plain and Pioneer Mountains and regularly can be found in or near the Monument.

Mule deer are scattered throughout most of the vegetated areas year-round; the south part of the Monument contains substantial winter range for deer [IDFG, 2003]. Mule deer occupy the northern areas in spring and summer, with two distinct herds migrating into the Pioneer Mountains by autumn [Griffith, 1983]. One of these herds comes from lands to the north and west of the Monument. The other herd winters in the desert area south of the Craters of the Moon Lava Field. This herd slowly migrates to the northwest as vegetation dries out throughout the summer. By late summer or early fall this herd has merged with the herd from the northwest. Upon reaching the riparian areas, they have access to water and browse that is still fresh. NPS monitoring since 1988 in the northwest part of the Monument indicates a very dynamic population that fluctuates greatly with varying annual conditions. This may even include shifting migration routes out of the area in some years [IDFG, 2003].

Elk occupy widely scattered areas of the Monument year-round, with recorded sightings from both immediately east and west of the Craters of the Moon Lava Field and in larger kipukas like Laidlaw Park. Large numbers of elk winter in the Pioneer Mountains along the northwest part of the Monument. Two distinct groups of more than 100 animals each were recorded moving back and forth across the west boundary during early 2003 [IDFG, 2003]. In summer, most of these elk move to mesic habitats west and north of the Monument; however, summer use has also been recently reported in central portions of the Monument such as the southern half of Laidlaw Park.

Pronghorn are found within much of the Monument and are common throughout the year in Laidlaw Park [IDFG, 2003]. A migrant herd of pronghorn uses the west part of the Monument as a migratory corridor and birthing area [IDFG, 2003]. Occasional use during winter has also been recorded in this area. Smaller numbers of animals can be found along the east boundary and near the Great Rift. Winter range has been identified in the southern areas and near the Great Rift [IDFG, 2003].

Moose colonized the riparian areas of the Monument in 1999 and are common in both the Big and Little Cottonwood Creek watersheds of the Pioneer Mountains. Suitable habitat is limited in the Monument, so further expansion is not likely.

Cougar and black bear are also found in the Pioneer Mountains area of the Monument. In recent decades, documented observations have been confined to the north part of the Monument in or adjacent to the Pioneer Mountains. Sightings of these two species are rare, and little is known about their status in the Monument.

Bighorn sheep infrequently occur in the Pioneer Bighorn Sheep Population Management Unit (PMU), which is approximately ten miles north of the Monument. This is the closest bighorn sheep PMU to the Monument. IDFG defines a PMU as: “a population or groups of connected populations in similar habitats with similar management priorities [IDFG, 2010]” The IDFG does not manage to maintain a population of bighorn sheep in the Pioneer PMU, and there does not appear to be a persistent bighorn sheep population in this PMU [IDFG, 2010]. Sporadic observations of bighorn sheep are documented within the Pioneer PMU every few years. Bighorn sheep have been observed 8–20 miles north and west of the Monument on 12 occasions from

1970-2006 [IDFG, 2013]. The source population for these sheep is unknown; they may be associated with either the East Fork Salmon River population or the Lost River population [IDFG, 2010]. Domestic sheep pose risk of disease transmission to bighorn sheep; contact between species can result in mortality to bighorn sheep individuals and reduce long-term herd health. Therefore, management focuses on minimizing potential contact between bighorn sheep and domestic sheep and preventing bighorn sheep that contact domestic sheep in this area from returning to an established population of bighorn sheep. The IDFG has agreed to BMPs with all of the known domestic sheep producers who operate within this PMU. These BMPs were developed to reduce the potential for contact between domestic and wild sheep. Specifically, the BMPs focus on prompt communication of bighorn sightings and minimizing the likelihood of contact between domestic and bighorn sheep. Furthermore, the BMPs outline methods IDFG may use when a bighorn sheep is sighted. These methods include monitoring, deploying a radio collar on, or euthanizing the bighorn sheep [IDFG, 2010].

Due to the lack of a persistent bighorn sheep population within the Pioneer PMU, a core herd home range has not been identified by the U.S. Forest Service for this unit. Core herd home ranges were delineated by the U.S. Forest Service to inform the Risk of Contact Tool USDA, 2013 where appropriate [Foster and Foster, 2015]. The Risk of Contact Tool is a GIS spatial model that provides a logical and documented process that quantifies the risk (percent probability) of a bighorn sheep intersecting a domestic sheep allotment, pasture, or trailing corridor [Mugoitio & Wilhelm, 2014;[USDA, 2013]]. The USFS defines a Core Herd Home Range (CHHR) in the Payette National Forest FSEIS (2010) as: “the area within which most herd individuals spend most (95 %) of their time.” The nearest CHHR to the Monument is associated with the Lost River PMU, which is approximately 19 miles from the Monument. The East Fork PMU/CHHR is approximately 56 miles from the Monument.

The Risk of Contact Tool was not utilized for the Pioneer PMU because of the lack of a persistent bighorn sheep population, no CHHR, and the need to incorporate hypothetical data. The Risk of Contact Tool was not utilized for the East Fork PMU because the distance from this PMU and associated CHHR is too great to register with the Risk of Contact Tool, which is spatially limited to 22 miles. The Risk of Contact Tool was utilized for the Lost River PMU, because some allotments overlapping the Monument occur within 22 miles of the Lost River CHHR. For the Lost River PMU/CHHR the analysis was considered for all allotments, regardless of current livestock type, because the conversion from cattle to sheep is allowed.

Four species of large mammals and one small mammal were extirpated from the Monument during the twentieth century. The North American bison, Rocky Mountain bighorn sheep, gray wolf, and grizzly bear were last documented in the early twentieth century [Smithsonian Institute, 2003]. One previously extirpated species, the porcupine, has recently reoccupied historical habitat within the Monument. Wolves from the reintroduced Central Idaho packs occupy territory immediately north of the Monument.

### ***Special Status Wildlife and Fish***

Special status species are those listed as endangered or threatened under the ESA, candidates or species proposed for listing under the ESA, listed by BLM as sensitive, or listed by the USFWS as a Bird Species of Conservation Concern or Focal Species. The BLM manages BLM sensitive species to provide conservation for those species and their habitats, and to minimize the need for future listing as threatened or endangered under the ESA. The NPS strives to manage its lands to protect any federal, state, or BLM-listed species.

Table 3.4, “Special Status Animal Species in the Monument Area” lists the special status animal species that are known or reported in the Monument area. The table is a representation of a dynamic list that is expected to change over the life of the plan. The most current list will always be the applicable special status species list.

**Table 3.4. Special Status Animal Species in the Monument Area**

MAMMALS		
Big brown bat ( <i>Eptesicus fuscus</i> )	California myotis ( <i>Myotis californicus</i> )	Gray wolf ( <i>Canis lupus</i> )
Kit fox ( <i>Vulpes macrotis</i> )	Fringed myotis ( <i>Myotis thysanodes</i> )	Little brown bat ( <i>Myotis lucifugus</i> )
Long-legged Myotis ( <i>Myotis volans</i> )	Long-eared myotis ( <i>Myotis evotis</i> )	Pallid bat ( <i>Antrozous pallidus</i> )
Piute ground squirrel ( <i>Uroditellus mollis</i> )	Pygmy rabbit ( <i>Brachylagus idahoensis</i> )	Western Small-footed Myotis ( <i>Myotis ciliolabrum</i> )
Townsend’s big-eared bat ( <i>Corynorhinus townsendii</i> )		
BIRDS		
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Black-throated sparrow ( <i>Amphispiza bilineata</i> )	Black tern ( <i>Chlidonias niger</i> )
Brewer’s sparrow ( <i>Spizella breweri</i> )	Calliope hummingbird ( <i>Selasphorus calliope</i> )	Columbian sharp-tailed grouse ( <i>Tympanuchus phasianellus columbianus</i> )
Eared grebe ( <i>Podiceps nigricollis</i> )	Ferruginous hawk ( <i>Buteo regalis</i> )	Grasshopper sparrow ( <i>Ammodramus savannarum</i> )
Green-tailed towhee ( <i>Pipilo chlorurus</i> )	Golden eagle ( <i>Aquila chrysaetos</i> )	Greater sage-grouse ( <i>Centrocercus urophasianus</i> )
Lesser scaup ( <i>Aythya affinis</i> )	Lewis’s woodpecker ( <i>Melanerpes lewis</i> )	Loggerhead shrike ( <i>Lanius ludovicianus</i> )
Long-billed curlew ( <i>Numenius americanus</i> )	Northern goshawk ( <i>Accipiter gentilis</i> )	Northern pintail ( <i>Anas acuta</i> )
Olive-sided flycatcher ( <i>Contopus cooperi</i> )	Peregrine falcon ( <i>Falco peregrinus</i> )	Sage thrasher ( <i>Oreoscoptes montanus</i> )
Sagebrush sparrow ( <i>Artemisiospiza belli</i> )	Short-eared owl ( <i>Asio flammeus</i> )	Williamson’s sapsucker ( <i>Sphyrapicus thyroideus</i> )
Willow flycatcher ( <i>Empidonax traillii</i> )	Western burrowing owl ( <i>Athene cunicularia</i> )	
REPTILES & AMPHIBIANS		
Western toad/Boreal toad ( <i>Anaxyrus boreas</i> )		
FISH		
Inland redband trout ( <i>Oncorhynchus mykiss gairdneri</i> )		
INVERTEBRATES		
Idaho point-headed grasshopper ( <i>Acrolophitus pulchellus</i> )	St. Anthony sand dunes tiger beetle ( <i>Cicindela arenicola</i> )	Blind cave leiodid beetle ( <i>Glacivacicola bathyscioides</i> )

The USFWS has provided a list of endangered, threatened, and proposed species that may be present in the five-county area surrounding the Monument. According to this list, threatened and endangered animal species that could potentially occur in counties that span the Monument are Canada lynx (*Lynx canadensis*), yellow-billed cuckoo (*Coccyzus americanus*), bull trout (*Salvelinus confluentus*), and the Snake River Physa snail (*Physa natricina*). Although not identified on the list, the Bliss Rapids snail (*Taylorconcha serpenticola*) and Banbury Springs limpet (*Lanx* sp.) were considered. However, habitat for these species is not available in the Monument. The Monument is not in a lynx analysis unit, does not contain critical habitat, and is not considered to provide suitable habitat for Canada lynx. The Monument also lacks suitable

habitat for the yellow-billed cuckoo. Individuals could occur in the vicinity of the Monument during migration but require relatively large ( $\geq 20$  ha) stands of cottonwood with a dense shrub understory for nesting. Cuckoos have been observed 10 - 20 miles south and west of the Monument in the Big Wood River and Snake River corridors. Surface water conditions are not adequate for the survival of bull trout or the snails, all of which require substantial riverine or cold-water spring habitat. There are several small perennial streams in the Pioneer Mountains at the north end of the Monument, but these streams rapidly become subterranean once they encounter the lava flows.

Animal species that were formerly federally listed but are now considered to be recovered include the gray wolf and bald eagle. The gray wolf was delisted on May 5, 2011. Wolves are known to occur in the vicinity of the Monument [Williams, 2002]; [IDFG & Nez Perce Tribe, 2014] and were observed and tracked just north of the Monument in spring and winter of 2001. The pack was thought to have followed migrating elk and deer. Individual wolves have also been observed near the boundary of the Monument, with several confirmed sightings in this area since 2000.

The bald eagle was delisted as a federally threatened species on August 8, 2007. There is a bald eagle breeding territory just west of the Monument near Carey Lake Marsh. Transient, wintering bald eagles might be found anywhere throughout Blaine, Butte, Lincoln, Minidoka, and Power Counties, including parts of the Monument.

The USFWS recently completed a status review for listing the greater sage-grouse as a Threatened or Endangered species under the ESA. In 2010 the USFWS determined that listing the sage-grouse was warranted for listing under ESA, but precluded by higher priority listing actions. This decision classified sage-grouse as a Candidate species under the ESA. In a subsequent settlement agreement, the USFWS was directed by the Court to make a final listing determination by September 30, 2015. In light of the 2010 "warranted but precluded" finding, and the USFWS conclusion that BLM and USFS land use plans were lacking adequate regulatory mechanisms to conserve sage-grouse, the BLM and USFS embarked on an effort to amend land use plans across most of the west to incorporate land use allocations and other measures designed to conserve sage-grouse. A Record of Decision for these amendments was signed on September 21, 2015. After a thorough analysis of the best available scientific information and taking into account ongoing key conservation efforts and their projected benefits the USFWS on September 22, 2015 determined that greater sage-grouse do not face the risk of extinction now or in the foreseeable future and does not need protection under the ESA. Sage-grouse will continue to be managed as a BLM Sensitive Species in Idaho. Sage-grouse occur throughout the sagebrush steppe ecosystem and are commonly found on the Monument and adjacent lands.

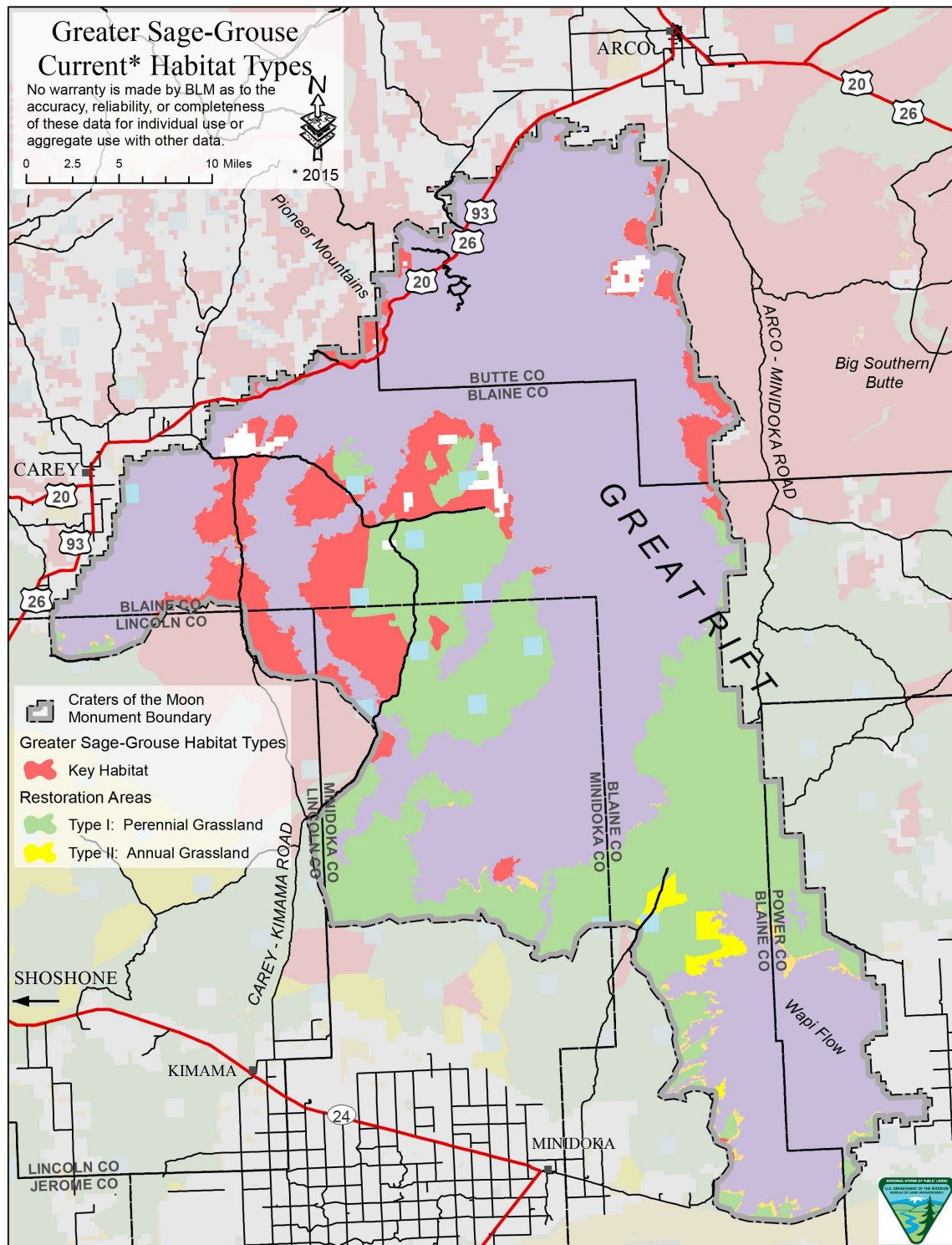
In 2000, Idaho BLM initiated the "Key Habitat Map" outlining areas of sagebrush used by sage-grouse at some point of the year, as well as potential restoration areas. The map has been updated annually by BLM with input from IDFG. The following are the habitat classifications of the "Key Habitat Map": Key, Restoration 1 (R1), Restoration 2 (R2), Restoration 3 (R3), and Recent Burn (RB) [Sather-Blair et al., 2000].

- Key habitat areas are generally large-scale, intact sagebrush steppe areas that provide sage-grouse habitat.
- R1 lands are sagebrush-limited areas with acceptable understory conditions in terms of perennial grass species composition.

- R2 lands are areas dominated or strongly influenced by invasive annuals such as cheatgrass, medusahead rye, or similar species. Areas with sagebrush may or may not be present, but in general, understories are not suitable for sage-grouse.
- R3 lands are areas where junipers and/or other conifers are encroaching into sage-grouse habitat areas.
- RB lands are areas that have recently burned and the type of habitat that is coming back and its restoration potential has not yet been determined.

Within the Monument, there is approximately 266,000 acres of mapped "Key Habitat" on BLM administered public land, of which 28% is Key, 60% is R1, 2% is R2, 0% is R3, 7% is RB, and 3% is not classified.





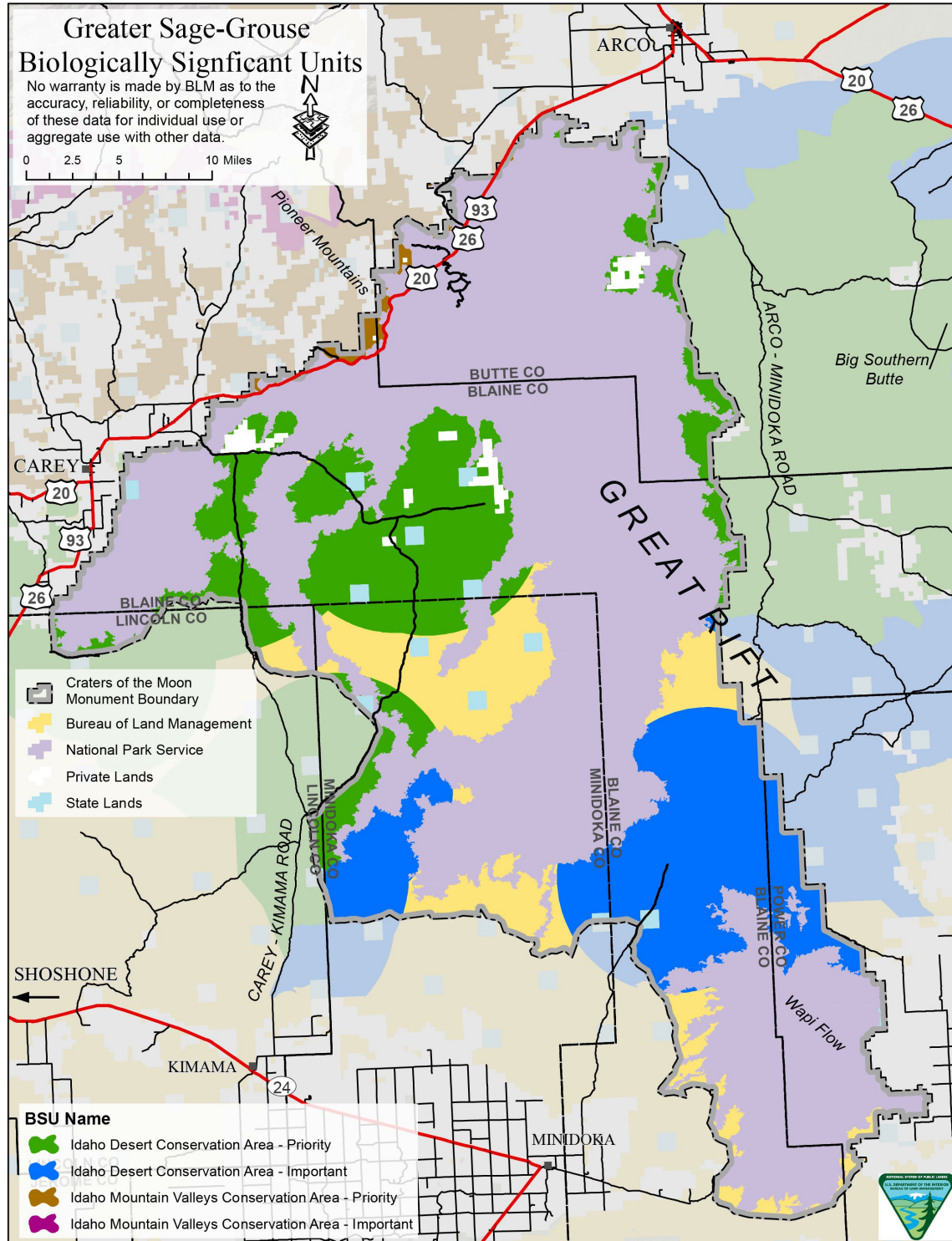
**Figure 3.8. Greater Sage-Grouse Current Habitat Types on BLM Monument Lands**

The BLM recently developed a national strategy to preserve, conserve, and restore sagebrush habitat for the sage-grouse. The Record of Decision for the GRSG ARMPA addresses threats to sage-grouse and their habitat, and has amended the 2007 MMP to provide management actions for the conservation of sage-grouse, as incorporated. This Amendment draws from numerous conservation planning and scientific documents. Principle documents include the following: Sage-grouse Habitat Assessment Framework: Multi-scale Habitat Assessment Tool, 2004 BLM National Sage-Grouse Habitat Conservation Strategy, 2011 Sage-grouse National Technical Team Report, State Wildlife Agency Greater Sage-Grouse Conservation Plans, U.S. Fish and Wildlife Service Sage-grouse Conservation Objectives Team Report, Western Association of Fish and Wildlife Agencies Greater Sage-Grouse Comprehensive Strategy, and USGS Open-File Report 2013-1098.

From this Decision the BLM and USFS have identified Priority Habitat Management Areas (PHMA), Important Habitat Management Areas (IHMA), General Habitat Management Areas (GHMA), and Sagebrush Focal Areas (SFA). PHMA habitat is generally described as having the highest conservation value to maintaining sustainable populations of sage-grouse. IHMA is generally described as lands that have a moderate to high conservation value for habitat and populations, but are not as important as PHMA. GHMA habitat is generally described as areas having lower quality or patchy habitat with reduced lek connectivity. Sagebrush Focal Areas are a subset of PHMAs, and provide for some additional conservation measures. In the Monument, approximately 52% (142,200 acres) of BLM-administered lands are classified as PHMA, 44% (121,400 acres) IHMA, 4% (10,800 acres) GHMA, and 52% (142,100 acres) SFA.

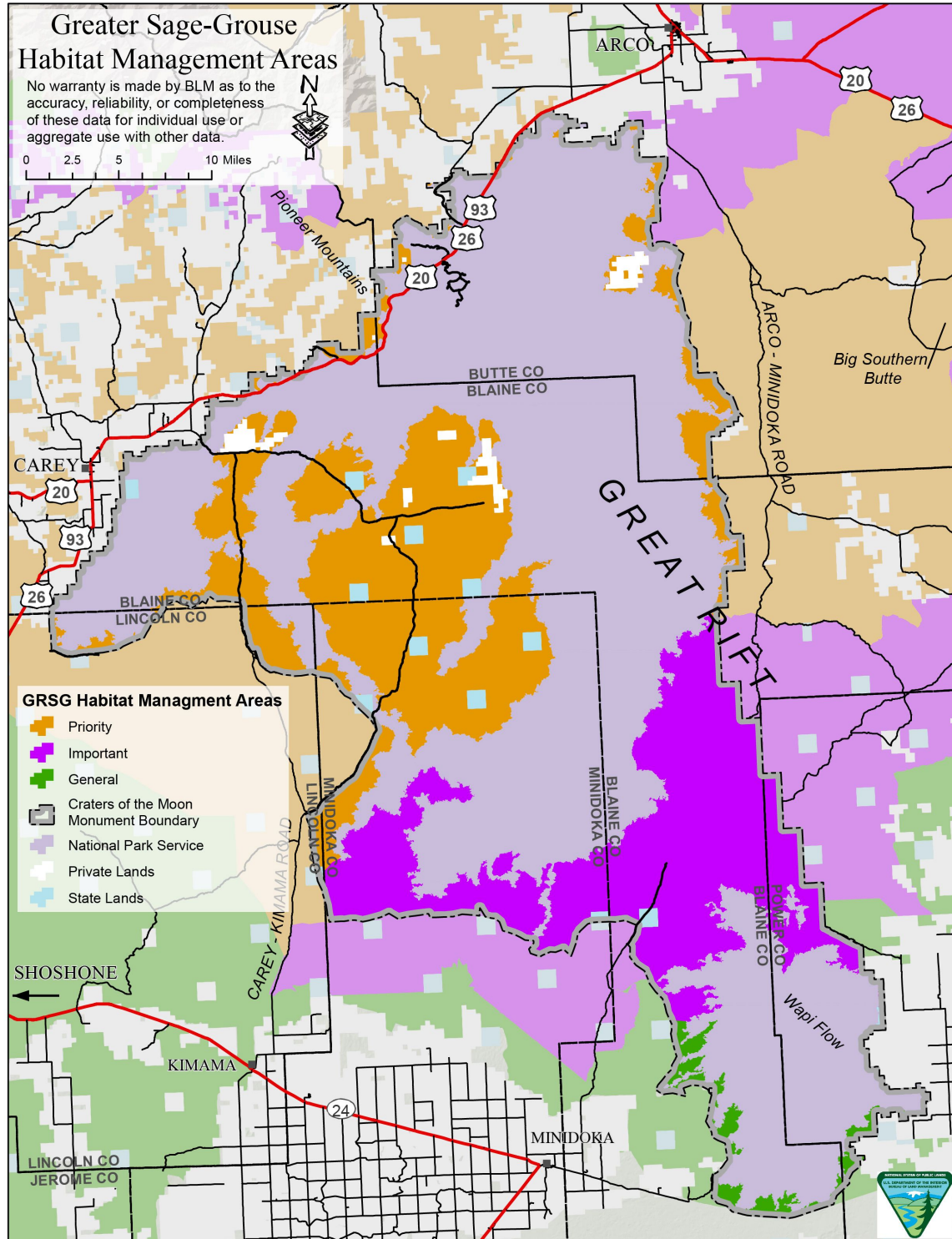
In addition to the aforementioned habitat management areas, the ID/SW MT Sub-regional EIS incorporates the use of Biologically Significant Units (BSU) which serves as the basis for anthropogenic disturbance calculations and analysis of adaptive management triggers. The ID/SW MT Sub-regional EIS defines a BSU as “a geographical area within greater sage-grouse habitat that contains relevant and important habitats and that is used as the basis for comparative calculations to evaluate changes to habitat. A biologically significant unit or subset of the unit is used to calculate the human disturbance threshold and the adaptive management habitat trigger.” In Idaho, BSUs consist of “all of the modeled nesting and delineated winter habitat, based on 2012 data, within PHMA and IHMA within a conservation area”. BSUs are stratified amongst conservation areas. A total of eight conservation areas are identified within Idaho. The Monument encompasses portions of the following conservation areas: Idaho Desert Conservation Area-Priority, Idaho Desert Conservation Area-Important, and Idaho Mountain Valleys Conservation Area-Priority.

The anthropogenic disturbance cap (3%) is identified as a threshold for development threats (e.g., mining, infrastructure, and energy development). This plan amendment does not propose development that would impact the disturbance cap. Disturbance calculations will be identified separate of this analysis. A full description of BSU development, anthropogenic disturbance, and adaptive management is available in Appendix E of the ID/SW MT Sub-regional EIS.

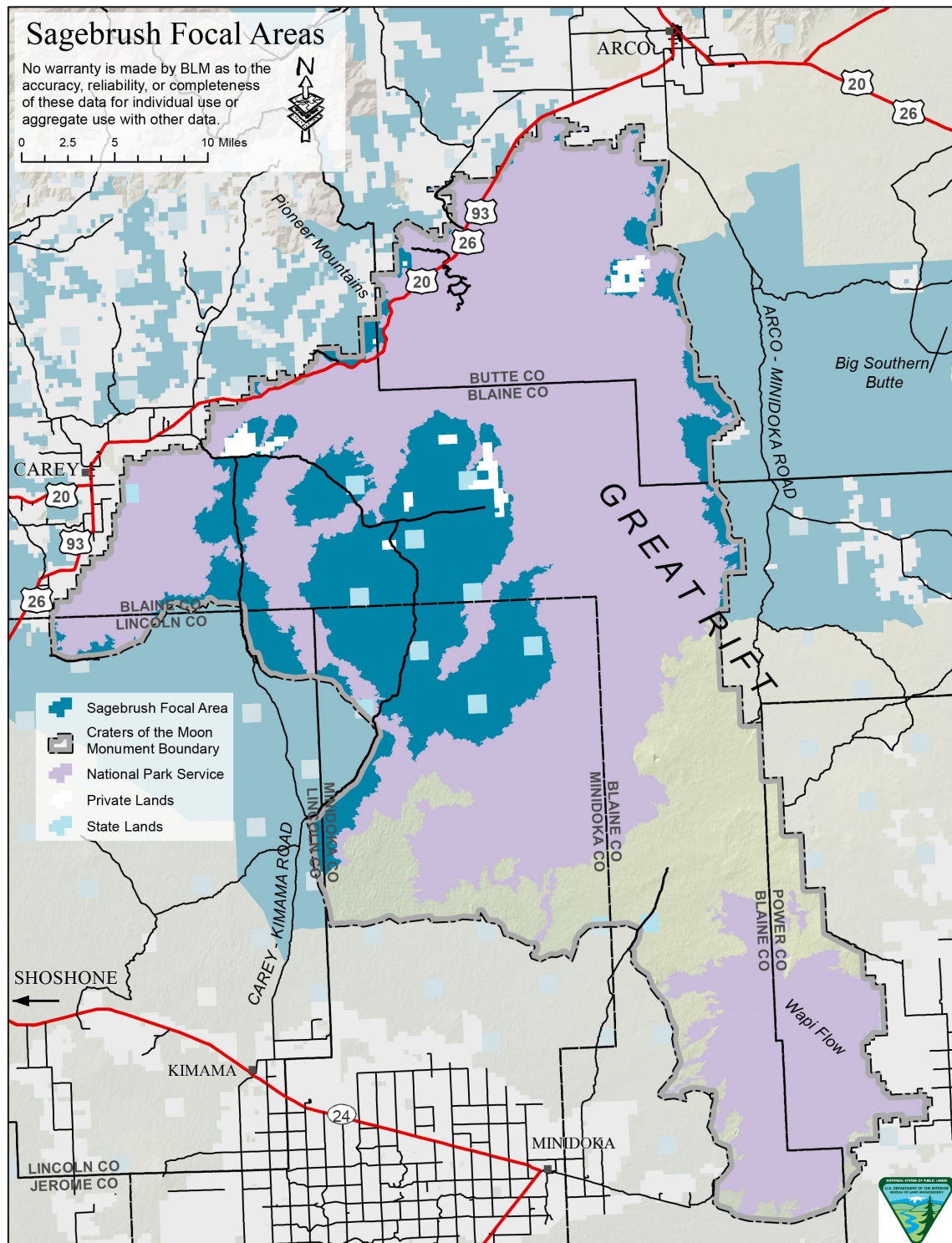


**Figure 3.9. Greater Sage-Grouse Biologically Significant Units in Craters of the Moon**





**Figure 3.10. Greater Sage-Grouse Habitat Management Areas on BLM Monument Lands**



**Figure 3.11. Sagebrush Focal Areas on BLM Monument Lands**

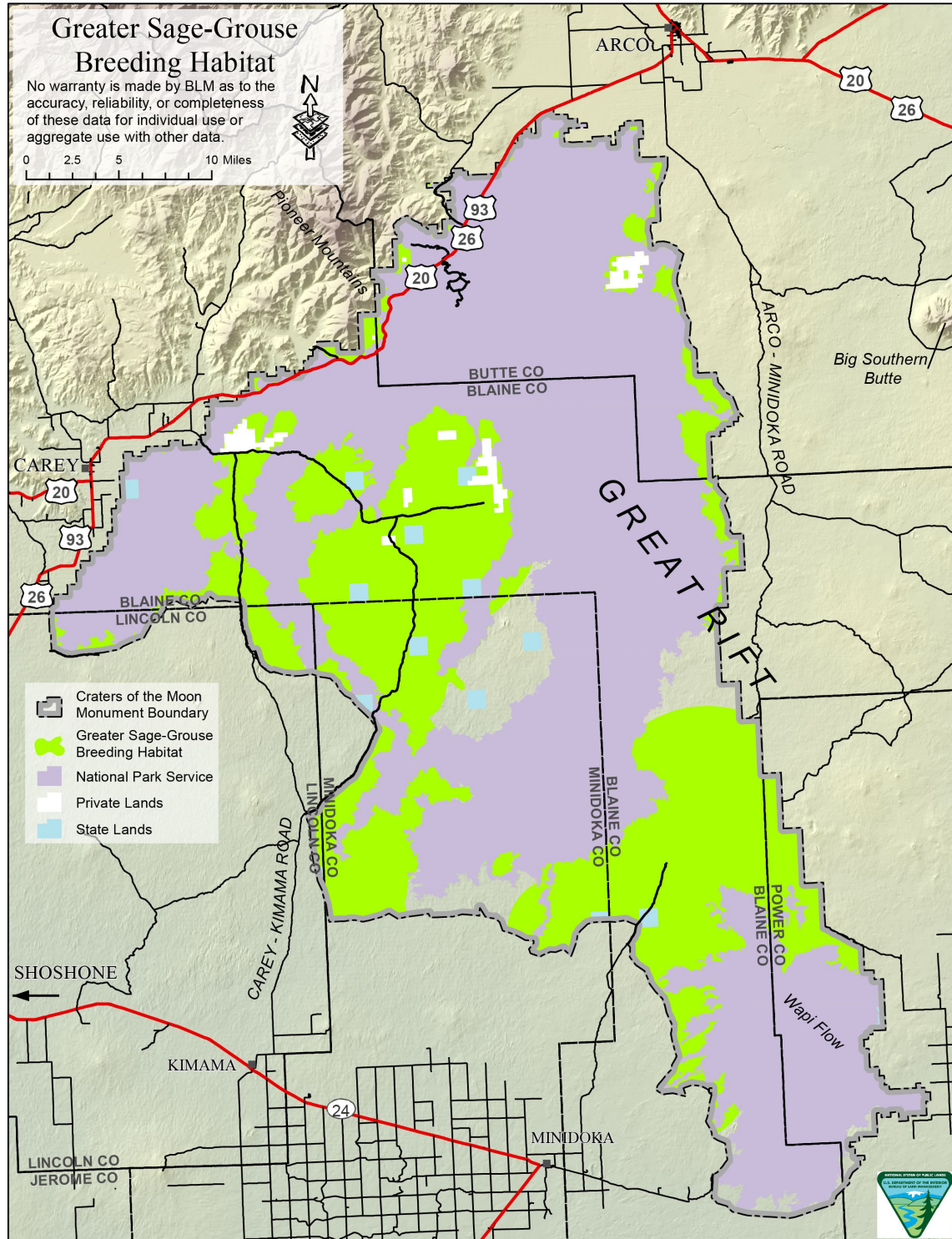
Sage-grouse within the Monument area are part of the Snake-Salmon Beaverhead population, which extends from central Idaho to southwestern Montana [Garton et al., 2011]. Sub-populations include the Upper Snake, Lemhi-Birch, Little Lost, Big Lost, and North Side Snake [Garton et al., 2011]. The Monument is predominately located within the North Side Snake sub-population, but the northern portion of the Monument does overlap the Big Lost sub-population. The Snake-Salmon Beaverhead population is considered to be at low risk, meaning that sage-grouse are common or uncommon, but not rare, and are usually widespread throughout the area [USDI USFWS, 2012 & 2013]. The population has fluctuated around 5,000 males since 1992 and was considered stable to increasing from 2007 to 2010; however, the population has markedly declined from historical levels [Garton et al., 2011]. Population abundance, as indicated by the average number of males per lek, declined by over half from 1965 to 2007 [Garton et al., 2011]. Observations made by IDFG in the Monument also indicate a significant decline in sage-grouse lek activity over the past half century. There are 110 leks on BLM administered public lands in the Monument, and 36 surveyed leks were documented as occupied in 2015. IDFG completed aerial lek surveys in the Monument in 2015 to identify and count new and historic sage-grouse leks. Specifically, Laidlaw, Little Park, and Paddleford Flat were surveyed. IDFG surveyed 90 historic leks, 36 of which were active, and identified 12 possible new leks. A total of 606 sage-grouse were observed during the survey [Meints & Rasmussen, 2015.]

Loss and fragmentation of sagebrush habitats has been cited as a primary cause of the decline of sage-grouse populations [Connelly, Knick, Schroeder, & Stiver, 2004]; [Schroeder et al., 2004]; [Leu & Hanser, 2011]. Potential and current threats to sage-grouse in the Monument include wildfire and the change in wildfire frequency, incursion of invasive plants, drought, and improperly managed livestock grazing [USDI USFWS, 2010 & 2013]. Regional threats also include urban and rural development, large-scale infrastructure (e.g., major roads, power lines, and wind energy facilities), disease, agricultural practices such as sagebrush control and insecticides, predation, human disturbance, sport hunting, seeded perennial grasslands, and conifer encroachment [North Magic Valley Sage-grouse Local Working Group (NMVLWG), 2011].

Occupied seasonal habitats for sage-grouse in the Monument were mapped in cooperation with the state wildlife agency (Appendix G, *Greater Sage-Grouse Occupied Seasonal Habitat Methodology on Craters of the Moon BLM National Monument Lands*). Historic and current data and knowledge by local sage-grouse experts were used to help identify seasonal use areas and to determine the migratory status of the local sage-grouse population. Three main sage-grouse seasonal use areas (breeding, summer, and late fall-winter) were identified. In many areas of the Monument, seasonal habitats overlapped or were occupied by sage-grouse year-round.

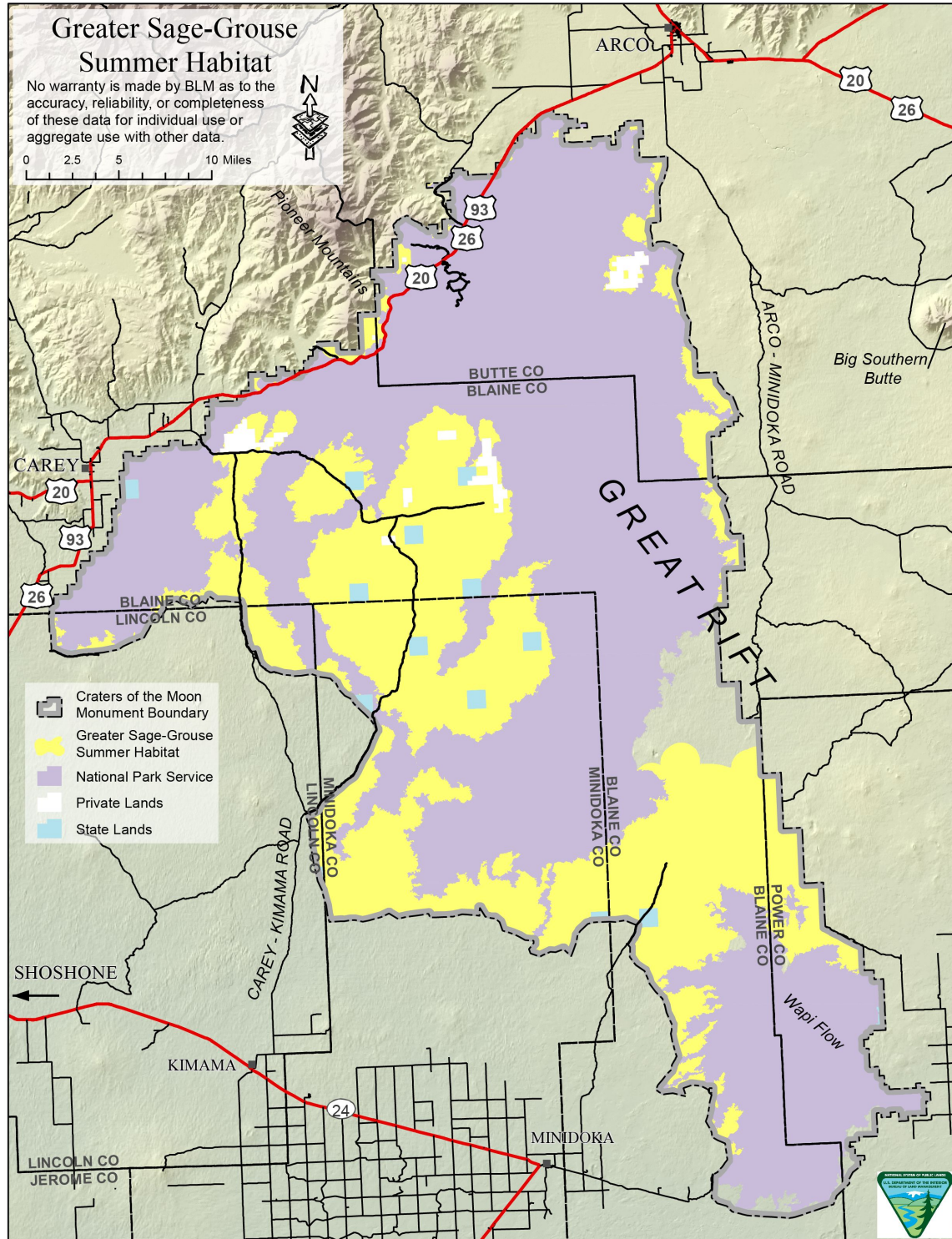
Occupied seasonal habitats were delineated based largely on the presence of sagebrush, occupied leks, previously mapped seasonal use areas, and/or sage-grouse observation data (primarily from telemetry studies). Approximately 212,400 acres of BLM administered public lands in the Monument were mapped as occupied breeding habitat (Figure 3.12, “Greater Sage-Grouse Occupied Breeding Habitat on BLM Monument Lands”). Occupied summer and late fall-winter habitats encompassed 248,900 and 204,000 acres, respectively (Figure 3.13, “Greater Sage-Grouse Occupied Summer Habitat on BLM Monument Lands”, Figure 3.14, “Greater Sage-Grouse Occupied Late Fall-Winter Habitat on BLM Monument Lands”).





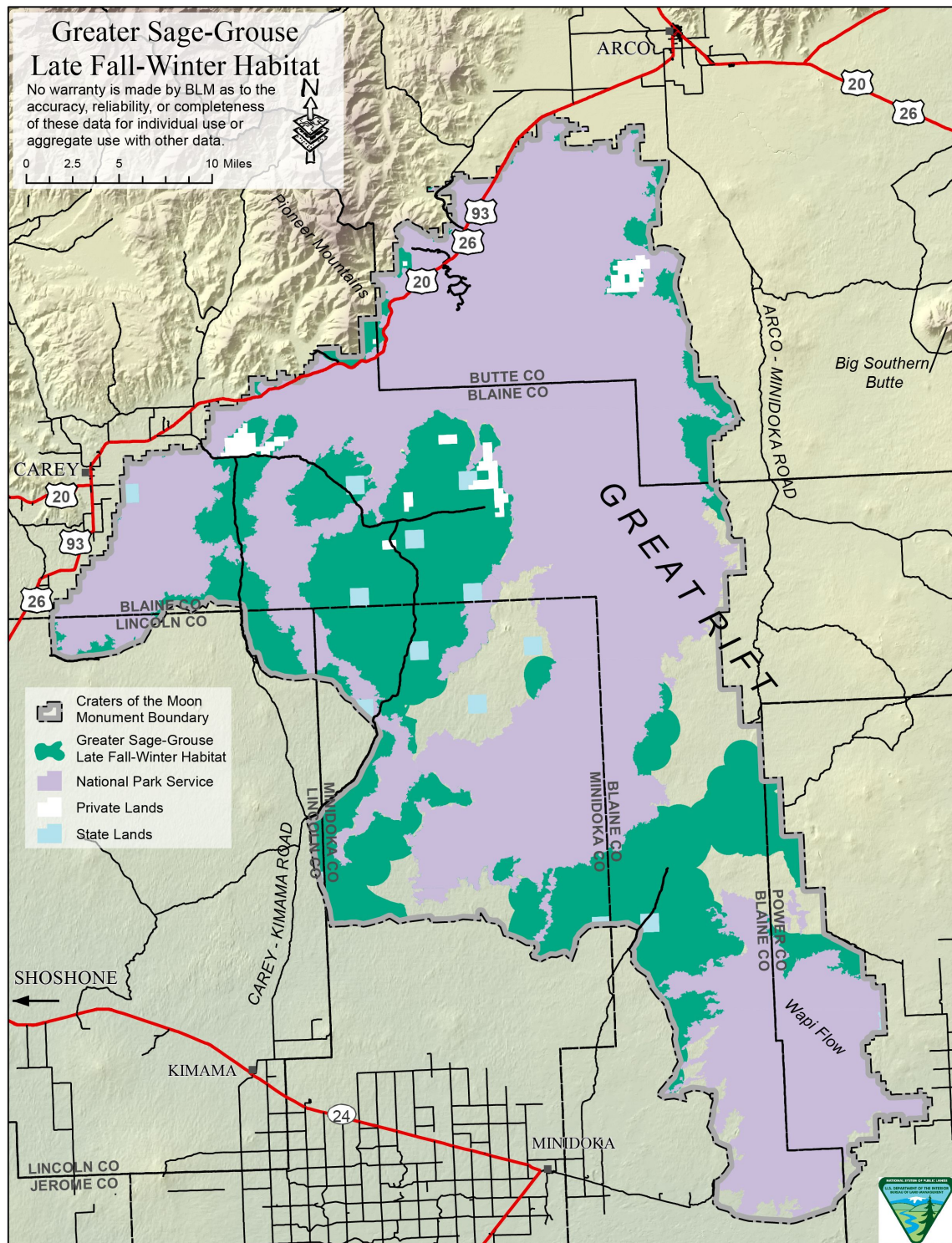
**Figure 3.12. Greater Sage-Grouse Occupied Breeding Habitat on BLM Monument Lands**





**Figure 3.13. Greater Sage-Grouse Occupied Summer Habitat on BLM Monument Lands**





**Figure 3.14. Greater Sage-Grouse Occupied Late Fall-Winter Habitat on BLM Monument Lands**

Habitat assessments conducted in 2012 and 2013 in Craters of the Moon revealed that approximately 16% of surveyed habitats currently known to be occupied by sage-grouse during the breeding season (March 15 - June 15; Appendix G, *Greater Sage-Grouse Occupied Seasonal Habitat Methodology on Craters of the Moon BLM National Monument Lands*) possessed the vegetative characteristics important for successful nesting and chick survival to sustain stable populations (Table 3.5, “Site-Scale Suitability Summary of Occupied Greater Sage-Grouse Habitats on BLM-Administered Lands in the Monument”). Approximately 30% of known, surveyed brood-rearing areas (occupied from June 16 - October 15) were determined to provide suitable habitat, and 37% of known, surveyed wintering areas (occupied from October 16 - March 14) met the habitat guidelines [Stiver, Rinkes, & Naugle, 2010]. Ecologically limited areas (e.g., sparsely vegetated, rocky inclusions) that would not have the potential to support plant communities that provide suitable habitat for sage-grouse given their edaphic and climatic potential [USDI BLM, 2001]) were not identified but are known to exist in localized areas throughout the Monument. Similarly, areas on the north end of the Monument that possess slopes in excess of 40% would not have the potential to provide suitable breeding habitat for sage-grouse [Idaho Sage-Grouse Advisory Committee (ISAC), 2006], although the sites are likely used by birds for foraging year-round.

**Table 3.5. Site-Scale Suitability Summary of Occupied Greater Sage-Grouse Habitats on BLM-Administered Lands in the Monument**

Suitability Rankings	Suitability Acreages for Sage-grouse Seasonal Habitat Areas		
	Breeding	Summer	Winter
Suitable Areas	20,766 (16%)*	47,819 (30%)	48,735 (37%)
Marginal Areas	59,432 (44%)	77,972 (50%)	20,163 (16%)
Unsuitable Areas	53,975 (40%)	31,066 (20%)	61,212 (47%)
<b>Total Surveyed Areas</b>	<b>134,173</b>	<b>156,858</b>	<b>130,110</b>

\* Percentages represent the percentage of ranked seasonal habitat within the total known occupied seasonal area.

Wildland fire has resulted in a lack of sagebrush cover, and is largely responsible for habitats not meeting the seasonal requirements for sage-grouse in many areas of the Monument. Specifically, of the areas identified as unsuitable for breeding habitat in the Monument, 73.3% of the sites were found to be unsuitable solely because sagebrush cover was lacking, and a lack of sagebrush was a contributing factor on an additional 24.0%. A lack of perennial grass and forb height, cover of mid-height native perennial bunchgrasses, and a low availability of forbs have also detracted from the ability of areas to provide for the life-cycle needs of sage-grouse in the planning area. Of the areas within the Monument identified as unsuitable for breeding habitat, 2.6% of the sites were solely due to low herbaceous cover, and a lack of herbaceous cover was a contributing factor on the 24% of sites previously mentioned. Excessive grazing by domestic livestock during the late 1800s and early 1900s, coupled with severe drought, has significantly impacted sagebrush ecosystems [Knick et al., 2003]. Long-term effects from this overgrazing, including changes in plant communities and soils, persist today [Knick et al., 2003]. Degradation continues to occur in localized areas where livestock congregate, including near water sources, supplements, corrals, and sheep bedding grounds [Jurs & Sands, 2004]. These areas are not large (generally

5 - 10 acres), but they are present throughout the Monument and increase the potential for the establishment and spread of noxious and invasive plants [Jurs & Sands, 2004].

Habitat suitability rankings for other sensitive Monument wildlife have not been assessed specifically. However, within their range, sage-grouse are dispersed into wide-ranging populations that utilize a diversity of habitats during each life stage (e.g., higher-elevation wet meadows and lower-elevation sagebrush flats). These factors make sage-grouse an appropriate focal species [Mills, 2007] for broader conservation of sagebrush habitats [Hanser & Knick, 2011]. Managing for sage-grouse will generally benefit other sagebrush-obligate species such as pygmy rabbit, sagebrush sparrow, and sage thrasher, as well as generalist species such as mule deer and pronghorn antelope. However, on finer scales, habitat guidelines for sage-grouse may not capture the needs of other species that utilize the sagebrush steppe. For example, some avian species require more or less sagebrush or herbaceous cover as compared to sage-grouse [Kaltenecker, Moser, & Bond, 2006]. In addition to managing for sage-grouse habitat, maintaining a resilient mosaic of vegetation communities that reflect the various transitional states of sagebrush steppe will be important over the Craters of the Moon landscape.

The pygmy rabbit, a BLM sensitive species, has been documented in several areas of the Monument. Records ranging from the 1930s through 2013 indicate locations from the southernmost areas to the NPS Monument lands [Hoffman, 1988]. Pygmy rabbit populations have experienced severe declines throughout their range, including Idaho. The rabbits generally prefer mature sagebrush stands with a dense canopy cover [Gabler, Heady, & Laundre, 2001] and relatively deep, friable soils. However, there are few surveys for the species in southern Idaho, and the distribution and status of the species is not well understood.

The Monument contains numerous caves and several cave-related species of concern, including seven species of bats that are USFWS species of concern, Idaho species of special concern, and/or BLM sensitive species. Only two maternity colonies of Townsend's big-eared bat have been confirmed in Idaho, and both sites are found in the Monument [IDFG, 2005]. Numerous hibernacula have been identified in the Monument for this and other bat species. Six other cave roosting bats that are classified as sensitive or of concern are found in the planning area [Keller & Saathoff, 1996]. In addition to bats, other cave species are of concern, including the blind cave leiodid beetle. Two of the five known worldwide sites for this species are in the Monument [IDFG, 2005].

Two additional insects listed as sensitive by BLM have been documented on lands adjacent to the Monument. One, the Idaho point-headed grasshopper, is found in the Lost River drainage. Two of the five known sites are near the northeast perimeter of the Monument. Their preferred habitat is relatively level or rolling terrain with gravelly to rocky soil having low sparse vegetative cover [IDFG, 2005] between 4,800 and 7,000 feet in elevation.

The Idaho dunes tiger beetle is found only in sand dunes in south central and southeast Idaho. Beetles have been documented at several sites near the southeast corner of the Wapi Lava Field [Idaho State Conservation Effort, 1996]. More potential habitat for this beetle may exist within the Monument in sand dunes and adjacent sandy soils [Idaho State Conservation Effort, 1996]. Potential and current threats to the species in the Monument include dune succession via invasion by native and exotic weeds as well as dune stabilization via grass seedings, trampling of larval burrows by livestock, and the use of insecticides such as Malathion [Idaho State Conservation Effort, 1996].

### **3.2.5. Native American Rights and Interests**

Native American Indians inhabited southern Idaho, including the present day BLM lands, for thousands of years prior to European contact. This ancient way of life was dismantled by settlement of America when large numbers of immigrants seeking land sought to displace the tribes. During the 1850s and 1860s treaties were negotiated with the tribes in the northwestern United States in order to acquire Indian lands for homesteading. The settlement of the northwestern United States by non-Indians led to the collapse of the Tribal Nations as they were previously known, including their economic, social, cultural, religious, and governmental systems.

The Federal government has a special trust responsibility to American Indian Tribes that is defined by treaties, statutes, and executive orders. According to the Department of the Interior Secretarial Order 3335, the trust responsibility covers lands, natural resources, money, or other assets held by the Federal government in trust or that are restricted against alienation for Indian Tribes and Indian individuals. Proper discharge of the trust responsibility requires BLM to protect treaty-based fishing, hunting, gathering, and similar rights of access and resource use on traditional tribal lands.

Within the planning area, the Shoshone-Bannock Tribes of the Fort Hall Reservation have rights to hunt (and by extension, to fish and gather plant foods) on the unoccupied lands of the United States; these rights are reserved in the Fort Bridger Treaty of 1868. The BLM is also responsible under statute, regulation and executive order to consult with Tribes, with or without treaties, whose interests might be affected by land use decisions. Ongoing consultation with the Shoshone-Paiute Tribes of the Duck Valley Reservation and the Shoshone-Bannock Tribes of the Fort Hall Reservation indicates that tribal interests include a wide range of natural and cultural resources. Effective collaboration and coordination, including government-to-government consultation, throughout the planning process are the keys to achieving the management goals of the BLM, while preserving tribal rights and interests in public land resources.

The BLM conducts government-to-government consultation with the Shoshone-Paiute and Shoshone-Bannock Tribes in accordance with the American Indian Religious Freedom Act, Executive Order 13007, BLM Manual 8120, Executive Order 13175 Consultation and Coordination with Indian Tribal Governments, Secretarial Order No. 3317 DOI Policy on Consultation with Indian Tribes, the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, the Archaeological Resource Protection Act, and Manual Handbook H-8120-1.8.

### **3.2.6. Cultural Resources**

The term cultural resources refers to all physical traces of past human activity on the landscape. They are a fragile, non-renewable resource, subject to impacts and degradation from many sources, both natural and human caused. The NHPA outlines the procedures by which Federal agencies are to evaluate and determine cultural resource significance and develop mitigation and preservation requirements. The Craters of the Moon National Monument contains a wide variety of cultural resources. Native American Tribes used this region continuously for at least the last 12,000 years. They crossed the Monument on their seasonal route to Camas Prairie to harvest camas lilies, making use of the natural resources along the way. Euro-American trappers and explorers first entered the region in the early 1800s, followed by thousands of immigrants on the Oregon Trail between 1845 and 1865, many of which took the Goodale's Cutoff through the northern end of the Monument.

The discovery of gold and other valuable minerals brought many more people to Idaho, including Chinese immigrants in the 1880s. The resulting conflict between Native Americans and the newcomers precipitated the removal of Native Americans to reservations at Fort Hall and Duck Valley. Several key events in the Bannock War of 1895 over Camas Prairie took place within the region. Railroads, such as the Oregon Short Line, were built and towns were founded across the area, but little development took place within the Monument. After the mining boom faded in the early 1900s, agricultural projects were built across the region, such as Magic Dam and Milner Dam, along with their many associated irrigation canals. Livestock grazing also became more prevalent. Numerous Basque immigrated to Idaho to work in the sheep industry and settled in Idaho. Early ranchers discovered Indian and game trails across the lava flows into the large kipukas of the Monument and began grazing livestock there. Later, roads were constructed across the lava flows to facilitate grazing in these kipukas. Traces of all these activities still remain on the landscape. David Louter (1992) completed a Historic Context Statement for the Monument that details the history of the Monument.

Cultural Resources within the Monument consist of over 500 Native American and Euro-American historic sites, as well as traditional cultural properties. Short segments of the Goodale's Cutoff of the Oregon Trail still serve as primitive routes on the north end of the Monument, but several portions of the trail have been destroyed by the construction of Highway 93. Historically, the trail was upgraded to serve as the main route from Arco to Carey before the new highway was built. Very few if any intact ruts remain. Goodale's Cutoff is currently under study for potential designation as a segment of the Oregon National Historic Trail. The congressionally authorized study is being conducted by the NPS.

Nearly 10% of BLM lands within the Monument have been inventoried to date, mostly as a result of post fire rehabilitation inventories and Section 110 inventory. Recent cultural resource overviews completed for the Monument [Henrikson, McAlister, & Long, 2006] and the Shoshone Field Office BLM [Henrikson, Guenther, & Cravins, 2009] document Native American use of the area. Geospatial studies have helped document Native American use patterns within the Monument and have been used to inform management decisions [Henrikson, 2005].

Currently, the main impacts on cultural resources are wildfires, wildfire suppression, and human vandalism/looting. Livestock concentration at water sites, mineral locations, or bed grounds can also impact archaeological site surfaces. Fires destabilize site surfaces by removing vegetation, which allows wind erosion to occur. Suppression activities and livestock trampling can have similar effects on site surfaces.

The BLM has developed a nationwide Programmatic Agreement (nPA) that governs the manner in which the BLM will meet its responsibilities under the NHPA. A State Protocol Agreement (SPA) for Idaho (2014) now implements the 2012 nPA by describing how the Idaho SHPO and the BLM will interact and cooperate pursuant to the nPA. The goal of this Protocol and the nPA is to continue the meaningful and productive partnership between BLM and the SHPO and to implement alternative procedures pursuant to 36 CFR § 800.14(b), to enhance the management of cultural resources (as defined by the BLM 8100 Manual, including properties of religious and cultural significance) under the BLM's jurisdiction.

### **3.2.7. Visual Resources**

Perpetuating scenic vistas and open western landscapes for future generations is one of the purposes and values identified for Craters of the Moon National Monument and Preserve. The

visual resources of Craters of the Moon represent a remnant of the undeveloped American West and one of the few remaining great expanses of sagebrush steppe. The contrasting lava flows were described in the 1924 Presidential Proclamation originally establishing the Monument as a “weird and scenic landscape peculiar to itself.” These lava flows create a unique viewscape in North America.

Gray-green sagebrush steppe and black lava fields abut the high Pioneer Mountains to the north. Across the Monument, 3,500 feet of vertical relief presents visitors with enormous panoramic views to the south. On a clear day, the Grand Tetons, 140 miles to the east, can be seen from the Monument. One of the nation’s clearest airsheds enhances these long, uninterrupted vistas.

The Monument contains numerous striking volcanic features such as pahoehoe and a’ a lava flows, cinder cones, spatter ramparts, and enormous lava fields. Low shield volcanoes and cinder cones (known locally as “buttes”) rise up throughout the entire landscape. The exposed lava varies in color, while shapes and textures of flows add scenic variety on a smaller scale. Nearly barren of vegetation, the most recent lavas at times flowed around kipukas, which offer some visual relief from the continuous lava. Expansive sagebrush steppe and grasslands, as well as the different ages and types of lava surfaces, support a remarkable variety of plant and animal communities that add to the visual diversity of the Monument.

Visual Resource Management VRM is a standard tool used by the BLM to identify and protect visual values on public lands (8400-Visual Resource Handbook and Manual Series).

The 2007 MMP placed all public land within Craters of the Moon National Monument and Preserve as either Class I or Class II management classes. There are currently no Class III or IV designations within the Monument. Generally, all BLM lands located within the Pristine Zone, Wilderness, and Wilderness Study Areas are designated Class I, while the rest of the Monument is designated Class II. The VRM classes provide standards for planning, designing, and evaluating future management actions.

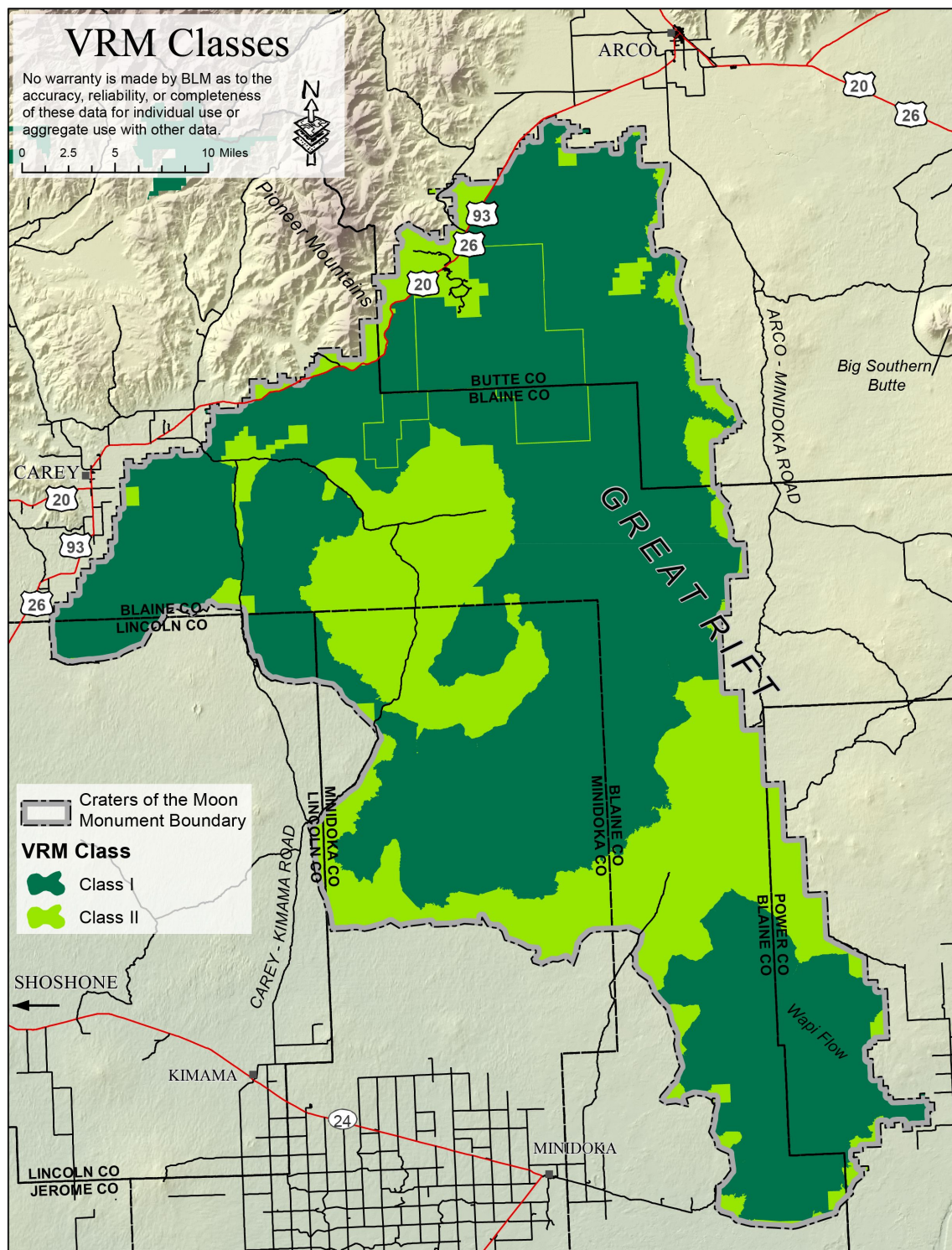
The Monument’s designated visual resource management classes and objectives are as follows:

- Class I – The objective of this class is to preserve the existing character of the landscape. Any contrast created within the characteristic landscape must not attract attention. This classification is applied to Visual ACECs, wilderness and WSAs, Wild and Scenic Rivers, and other similar situations.
- Class II – The objective of this class is to retain the existing character of the landscape. Changes in any of the basic visual elements caused by management activity should not be evident in the landscape. A contrast may be seen but should not attract attention.

**Table 3.6. Visual Resource Management Class Areas in Craters of the Moon National Monument & Preserve**

VRM Class	BLM Managed Acres	Percent of BLM Managed Acres in the Monument
Class I	73,500	27%
Class II	201,600	73%





**Figure 3.15. Visual Resource Management Classes in Craters of the Moon National Monument & Preserve**

### 3.2.8. Wilderness Study Areas

According to BLM Manual 6330, *Management of Wilderness Study Areas*, BLM’s objectives are, consistent with relevant law, to manage and protect wilderness study areas (WSA) to preserve wilderness characteristics so as not to impair the suitability of such areas for designation by Congress as wilderness and to provide policy guidance for prolonged stewardship of WSAs until Congress makes a final determination on the management of WSAs.

The Monument contains all or part of four wilderness study areas including Raven’s Eye, Great Rift, Bear Den Butte, and Little Deer. The total WSA acreage within the Monument and Preserve is approximately 471,300. Of those acres, 389,600 have been recommended by BLM as “suitable” for designation as wilderness in the 1991 Idaho Wilderness Study Report. Prior to Proclamation 7373, the BLM managed these WSAs in their entirety; however, after the Proclamation, the lava within the Monument boundary was transferred to the NPS, which included most of the WSA acreage.

Some human-made facilities in the WSAs include wildlife guzzlers, sheep bed grounds, fences, and watering structures associated with livestock use. The sights and sounds of roads adjacent to the WSAs are visible and audible from within limited portions of the WSAs. Communication towers near Arco and Lava Lake are visible from portions of the Great Rift WSA. Refer to pages 166-168 in the 2007 Craters of the Moon Monument Management Plan for a more in-depth description of the Monument’s WSAs.

**Table 3.7. Summary of Wilderness Study Areas**

Wilderness Study Area	Acres within the Monument	NPS Acres	BLM Acres	Total Acres	Acres within Monument Recommended Suitable by BLM
Great Rift	381,100	335,000	46,000	381,800	322,450
Raven’s Eye	45,400	37,000	8,400	68,300	67,110
Little Deer	35,100	21,300	13,800	35,200	0
Bear Den Butte	9,700	4,300	5,400	9,700	0

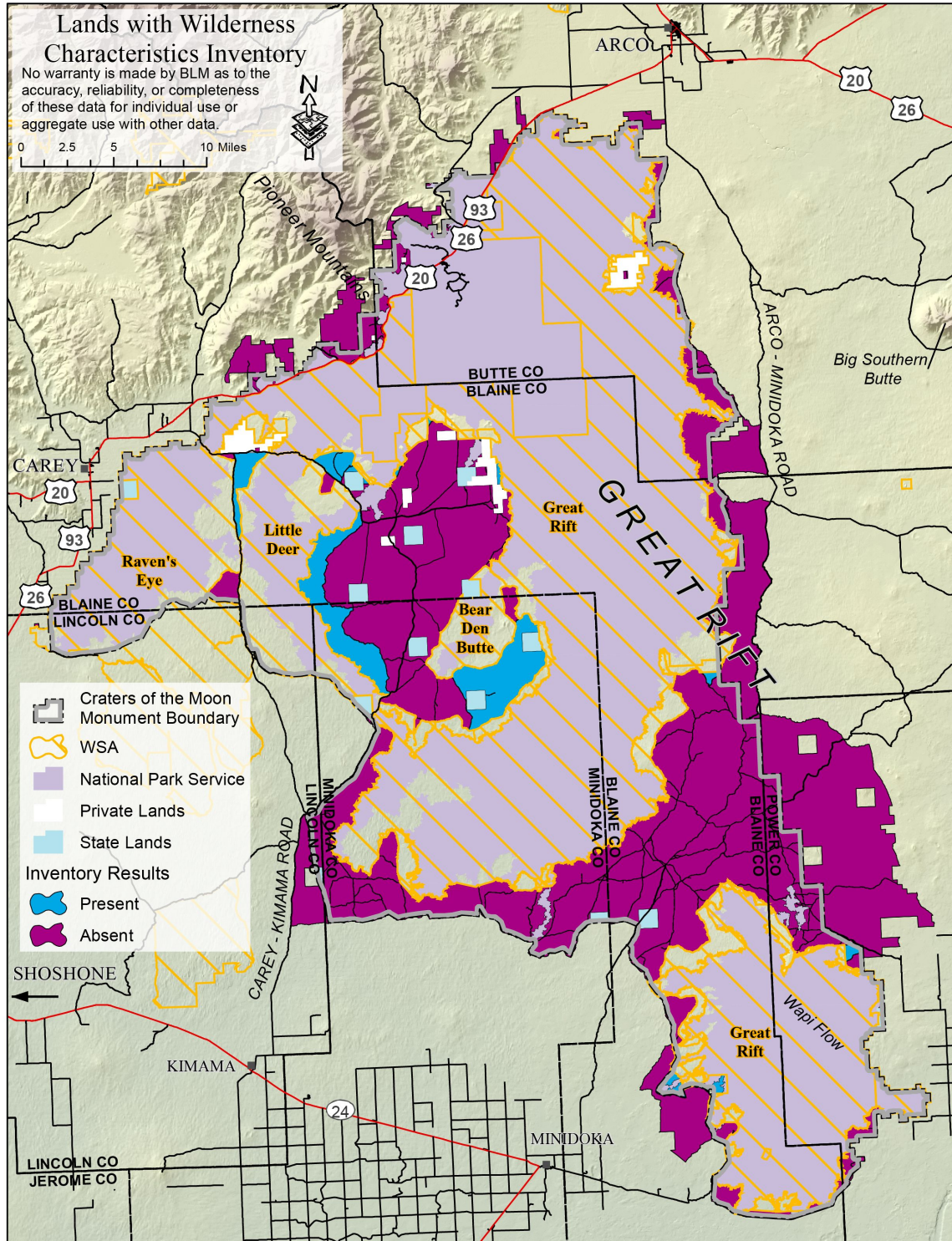
### 3.2.9. Lands with Wilderness Characteristics

Section 201 of FLPMA requires the BLM to maintain an inventory, on a continuing basis, of all public lands and their resources and other values, which includes wilderness characteristics. It also provides that the preparation and maintenance of the inventory shall not, of itself, change or prevent change of the management or use of public lands. Regardless of past inventory, the BLM must maintain and update as necessary, its inventory of wilderness resources on public lands. The primary function of an inventory is to determine the presence or absence of wilderness characteristics [Manual 6310, p. 2]. According to BLM Manual 6310, *Conducting Wilderness Characteristics Inventory on BLM Lands*, “Managing the wilderness resource is part of the BLM’s multiple use mission. Lands with wilderness characteristics provide a range of uses and benefits in addition to their value as settings for solitude or primitive and unconfined recreation.”

The Monument’s lands with wilderness characteristics inventory was completed in 2014, with 21,300 acres found to contain wilderness characteristics. Refer to Figure 3.14, Inventory for Lands with Wilderness Characteristics Map for a summary overview and



[http://www.blm.gov/id/st/en/prog/lands\\_with\\_wilderness/lwc\\_id\\_twinfallsdistrict.html](http://www.blm.gov/id/st/en/prog/lands_with_wilderness/lwc_id_twinfallsdistrict.html) for more details.



**Figure 3.16. Inventory for Lands with Wilderness Characteristics Map**

### 3.3. Resource Uses

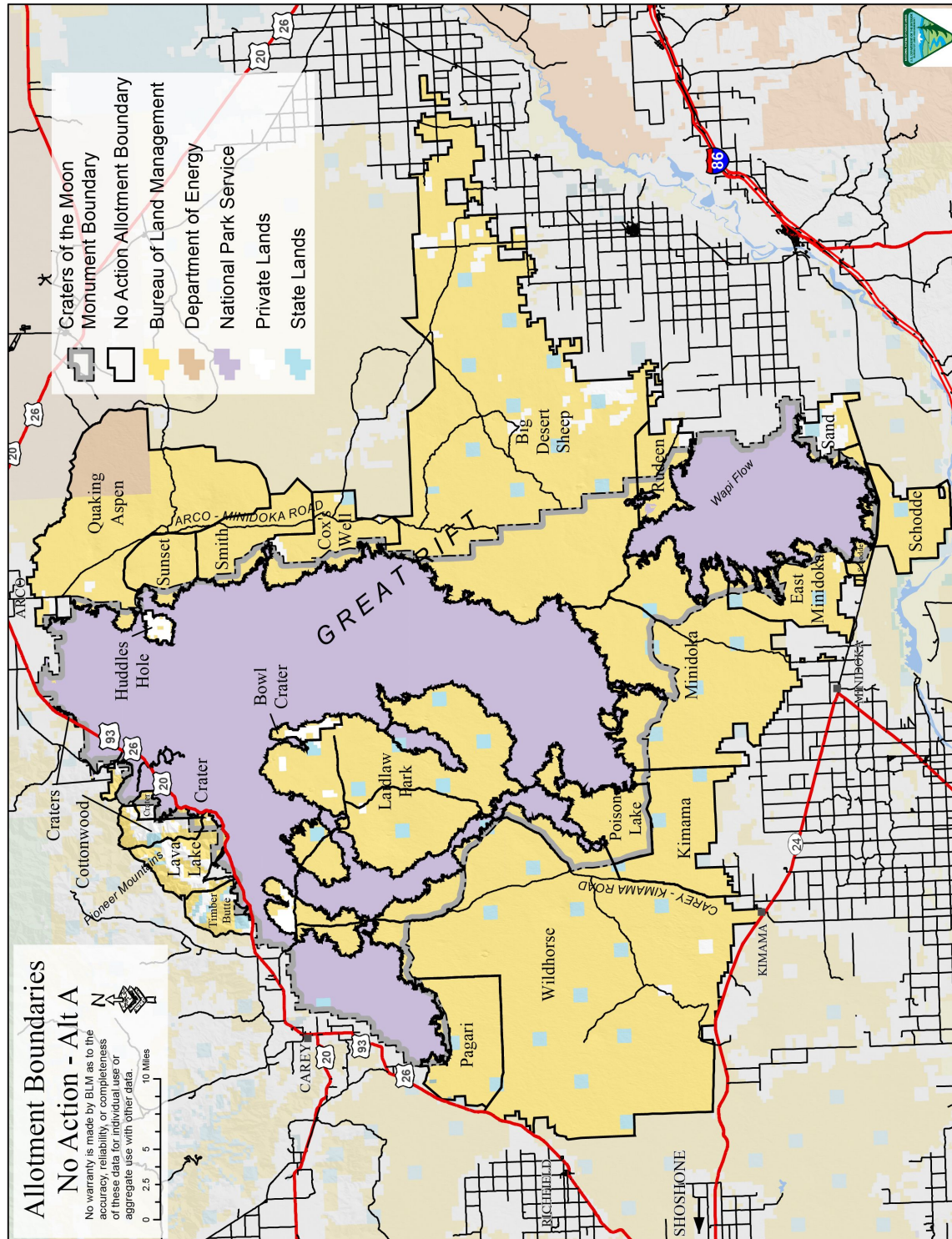
#### 3.3.1. Livestock Grazing

Livestock grazing on BLM is divided up into smaller, more manageable areas called allotments. Grazing on these allotments is managed through a permitting process, in which certain mandatory terms and conditions are specified. A grazing permit is required by 43 CFR 4130.3 (2005) to specify the kind (species of animal) and number of livestock to be allowed; the period of the year in which grazing would be allowed (season of use); the allotments to be used; and the amount of use to be allowed in AUMs. Other terms and conditions can be specified as well that will assist in achieving management objectives, provide for proper range management, or assist in the orderly administration of the public rangelands.

Generally, one AUM equates to about 790 pounds of dry forage. Current AUM levels in the Monument were based on earlier vegetation production inventories and analyses to determine how much forage would be allocated for livestock and how much would be allocated for other uses, such as wildlife and watershed needs and were originally implemented in the 1980s. AUM levels in the allotments involved with the Monument were established through their respective land use plans and were adopted based on land area through the 2007 MMP. The effects of the current use levels are monitored for each allotment to determine if future adjustments are necessary to maintain or improve rangeland health.

The Monument is cooperatively managed by the NPS and the BLM. NPS administers 463,300 acres, or 62%, of the Monument, and that area is not available for livestock use. NPS lands consist primarily of exposed lava flows, which are mostly devoid of available forage and/or inaccessible to livestock; therefore, prohibiting grazing in these areas had little to no impact on the livestock industry. The BLM administers 275,100 acres, of which 273,900 are currently allocated for grazing. This land is divided into 22 allotments that are administered by three field offices in two BLM districts (see Figure 1.4, “Allotment Administration”).





**Figure 3.17. Livestock Grazing Allotments (Current Management)**

Presidential Proclamation 7373 (2000) states, “Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the Monument administered by the Bureau of Land Management.”

The planning area is unique in its grazing management due to the overlapping of the Monument boundary with allotments administered through three different BLM field offices. The planning area includes portions of 18 allotments along with four allotments that lie wholly within the Monument. The Monument boundary is rarely along any other administrative boundary or other barrier to livestock movement. In this discussion of grazing allotments, all figures (acres and percentages) will be based on the amount of each allotment that lies within the Monument and is administered by the BLM unless otherwise specified.

Existing grazing allotments include 6,600 acres of private land and 8,200 acres of State land within the Monument. Some of the land controlled by permittees is offered for exchange-of-use and is managed in conjunction with the public lands; the rest is informally managed as part of the allotments. Unallotted tracts total 1,200 acres, consisting primarily of isolated parcels of public land and were made unavailable to livestock grazing in the 2007 MMP.

Presently 86 permittees in the planning area are allocated 38,187 AUMs. This total is the maximum amount of forage that can be allocated in the Monument at any one time, and actual use or total permitted use could be any amount below this total based on allotment-specific analysis. Of the total, 16,548 AUMs are allocated for cattle and 21,639 AUMs are allocated for sheep. Since 1997, livestock use has averaged 11,791 AUMs within the Monument, which is 31% of the permitted use. The lower use levels have primarily been from sheep permittees leaving allotments as forage matures and dries out, and moving on to other BLM allotments or Forest Service allotments without using all of their permitted AUMs. Some cattle permittees have also used fewer AUMs, either as a result of their own operational fluctuations or due to changing forage conditions, such as following a wildfire or drought. Total forage production in the Monument has been estimated at 111,300 AUMs in an unfavorable year and 227,900 AUMs in a favorable year Figure D.1, “Existing Ecological State in Craters of the Moon”.

The analysis in this document is based on Actual Use; the use reported at the end of the grazing season by permittees. It is an accurate account of the livestock use in an allotment throughout the grazing season. Billed use may differ from Actual Use, because some allotments are billed before grazing occurs, based on a grazing application that reflects the permittees' plans for the upcoming grazing season. Therefore, some fluctuations in plans may occur, causing billed use to differ from Actual Use. Where Actual Use is not obtained, however, billed use will be assumed to reflect Actual Use.

Two allotments are solely allocated for sheep, 13 allotments are solely allocated for cattle, and seven allotments are allocated for both. In nine allotments, several operators run livestock in common, while the other 13 allotments are permitted to single operators.

Grazing systems, or acceptable grazing practices, for allotments are detailed in Allotment Management Plans (AMPs). AMPs in the Monument range in date of establishment from 1991 to 2011. Grazing systems are developed by the BLM in conjunction with livestock operators and other interested parties. AMPs are subject to Standards (Appendix H, *Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management [USDI BLM, 1997]*), as are adjustments made to AUM allocation. The Standards for Rangeland Health in the State of Idaho

are, “the Bureau of Land Management’s management goals for the betterment of the environment, protection of cultural resources, and sustained productivity of the range” [USDI BLM, 1997].

Rangeland Health evaluations have been conducted on 20 out of 22 Monument allotments, as shown in Table 3.8, “Standards and Guidelines Assessments in Monument Associated Allotments”. These evaluations begin with consultation between BLM staff, interested publics, and resource users. Field assessments and evaluations are then conducted to determine the achievement or non-achievement for each Standard. If a Standard is not being met or is not making significant progress towards being met, then the cause for non-achievement must be determined. If livestock grazing practices are determined to be the cause, BLM is required by regulation to change livestock management to meet or to make significant progress toward meeting all applicable Standards. Table 3.8, “Standards and Guidelines Assessments in Monument Associated Allotments” lists all allotments associated with the Monument. In allotments where all Standards were not met and livestock grazing practices were determined to be the cause, changes to management were made to lead towards uniform achievement of all Standards. Management changes that have occurred in the allotments listed in the following table include implementing rest-rotation grazing systems, adjusting AUM levels, setting sheep to cattle conversion rates, designated cattle and sheep pastures, limitations on sheep bedgrounds and watering sites, and riparian exclosures. Preliminary monitoring data and the HAF data collected in 2012 and 2013 show that progress is being made towards meeting Standards in the Monument. The individual allotments will be assessed during the implementation of this amendment to fully evaluate any site-specific responses to management changes.

**Table 3.8. Standards and Guidelines Assessments in Monument Associated Allotments**

Allotment	Year Evaluated	Standard 1–Water-sheds	Standard 2–Riparian Areas and Wetlands	Standard 3–Stream Channel/ Floodplain	Standard 4–Native Plant Com-munities	Standard 5–Seedings	Standard 6–Exotic Plant Com-munities, other than Seedings	Standard 7–Water Quality	Standard 8–Threat-ened and Endangered Plants & An-imals
Big Desert Sheep	2011	Meeting	NA	NA	Not Meeting but Making Significant Progress	Meeting	NA	NA	Not Meeting but Making Significant Progress
Bowl Crater	2004	Meeting	NA	NA	Meeting	NA	NA	NA	Not Meeting (Fire)
Cottonwood	1999	Meeting	Not Meeting (Livestock)	Not Meeting (Livestock)	Meeting	NA	NA	Meeting	Meeting
Cox’s Well	2004	Meeting	NA	NA	Not Meeting but Making Significant Progress	NA	NA	NA	Not Meeting but Making Significant Progress
Crater	1999	Meeting	Not Meeting (Livestock)	Not Meeting (Livestock)	Meeting	Meeting	NA	Meeting	Meeting
Craters	2011	Meeting	NA	NA	Meeting	NA	NA	NA	Meeting
East Minidoka	1999	Meeting	NA	NA	Meeting	Meeting	NA	NA	Not Meeting (Fire)
Huddle’s Hole	1999	Meeting	NA	NA	Meeting	Meeting	NA	NA	Meeting
Kimama	1999	Meeting	NA	NA	Not Meeting (Livestock)	Not Meeting	Not Meeting	NA	Not Meeting
Laidlaw Park	2002	Meeting	NA	NA	Not Meeting	Meeting	NA	NA	Not Meeting
Lava Lake	2007	Meeting	Meeting	Meeting	Meeting	Meeting	NA	Meeting	Meeting
Minidoka	2004	Meeting	NA	NA	Not Meeting (Fire)	Meeting	NA	NA	Not Meeting (Fire)
Pagari	2007	Meeting	Not Meeting but Making Significant Progress	Not Meeting but Making Significant Progress	Not Meeting (Fire)	Meeting	NA	Not Meeting	Not Meeting but Making Significant Progress
Poison Lake	Not Yet Evaluated								

Allotment	Year Evaluated	Standard 1–Water-sheds	Standard 2–Riparian Areas and Wetlands	Standard 3–Stream Channel/ Floodplain	Standard 4–Native Plant Com-munities	Standard 5–Seedings	Standard 6–Exotic Plant Com-munities, other than Seedings	Standard 7–Water Quality	Standard 8–Threat-ened and Endangered Plants & An-imals
Quaking Aspen	2010	Meeting	NA	NA	Meeting	NA	NA	NA	Meeting
Rudeen	2004	Meeting	NA	NA	Not Meeting but Making Significant Progress	Not Meeting but Making Significant Progress	NA	NA	Not Meeting but Making Significant Progress
Sand	2004	Meeting	NA	NA	Meeting	Meeting	NA	NA	Meeting
Schodde	1999	Meeting	NA	NA	Meeting	Meeting	NA	NA	Not Meeting (Fire)
Smith	2012	Meeting	NA	NA	Not Meeting but Making Significant Progress	Not Meeting but Making Significant Progress	NA	NA	Not Meeting (Livestock)
Sunset	2010	Meeting	NA	NA	Meeting	NA	NA	NA	Meeting
Timber Butte	Not Yet Evaluated								
Wildhorse	1999	Meeting	Not Meeting but Making Significant Progress	Meeting	Not Meeting (Livestock)	Not Meeting but Making Significant Progress	Meeting	Not Meeting	Not Meeting but Making Significant Progress



Structural range improvements in the Monument include fences, cattle guards, riparian exclosures, reservoirs, water gap structures, wildlife guzzlers, corrals, wells, and pipelines with associated water troughs. Non-structural range improvements within the Monument include seedings, fire rehabilitation and restoration projects, fuel breaks, and road rehabilitations. Rangeland improvements are used in the Monument to improve livestock distribution, provide livestock forage, restore degraded areas, protect sensitive sites, improve wildlife habitat, and facilitate management of livestock. Many of these are also closely associated with the road system in the Monument.

Trailing of livestock between allotments is another common practice in the livestock industry, and historical trail routes are still used today in many areas of the Monument. The majority of this trailing occurs along existing roads. These corridors were designated for primary management by the BLM to allow for continued livestock trailing and other authorized uses in these corridors. Trailing is a separately authorized use and the effects are analyzed as part of the 2013 Shoshone Field Office Livestock Trailing Permit EA (DOI-BLM-ID-T030-2012-0044-EA).

### **3.3.2. Travel and Transportation**

The amount and types of travel allowed within the Monument were determined by the 2007 MMP and subsequent 2009 Craters of the Moon National Monument and Preserve Comprehensive Travel Management Plan (TMP).

All routes are designated open, limited, or closed as depicted on the Craters of the Moon National Monument and Preserve Travel Map.

Off-highway vehicle (OHV) use in the Monument includes off-highway motorcycles, all-terrain vehicles (ATVs), utility vehicles (UTVs), snowmobiles, and other motorized vehicles. Most OHV use in the Monument occurs during hunting seasons or in association with other land uses such as livestock operations.

The amount of OHV-specific recreation on the BLM portions of the Monument is small. Recreation Management Information System (RMIS) data estimates an average of less than 3,500 visits per year. Most OHV activity takes place on the route network, since no trails have been designated for motorized use. The primary use periods are spring and fall. A small amount of mountain biking occurs in the expanded Monument.

According to the comprehensive TMP, livestock operators use the existing route network for a variety of livestock management activities such as trailing livestock, hauling water, moving sheep camps, and maintaining existing facilities. Combining the cattle and sheep use together yields an estimated 1,575 vehicles using the route network per year for all grazing-related activities. For a more detailed description of how livestock operations utilize the transportation network, refer to page 45 in the Craters of the Moon National Monument and Preserve Comprehensive Travel Management Plan EA [ID-230-2007-EA-332].

### **3.3.3. Recreation and Visitor Use**

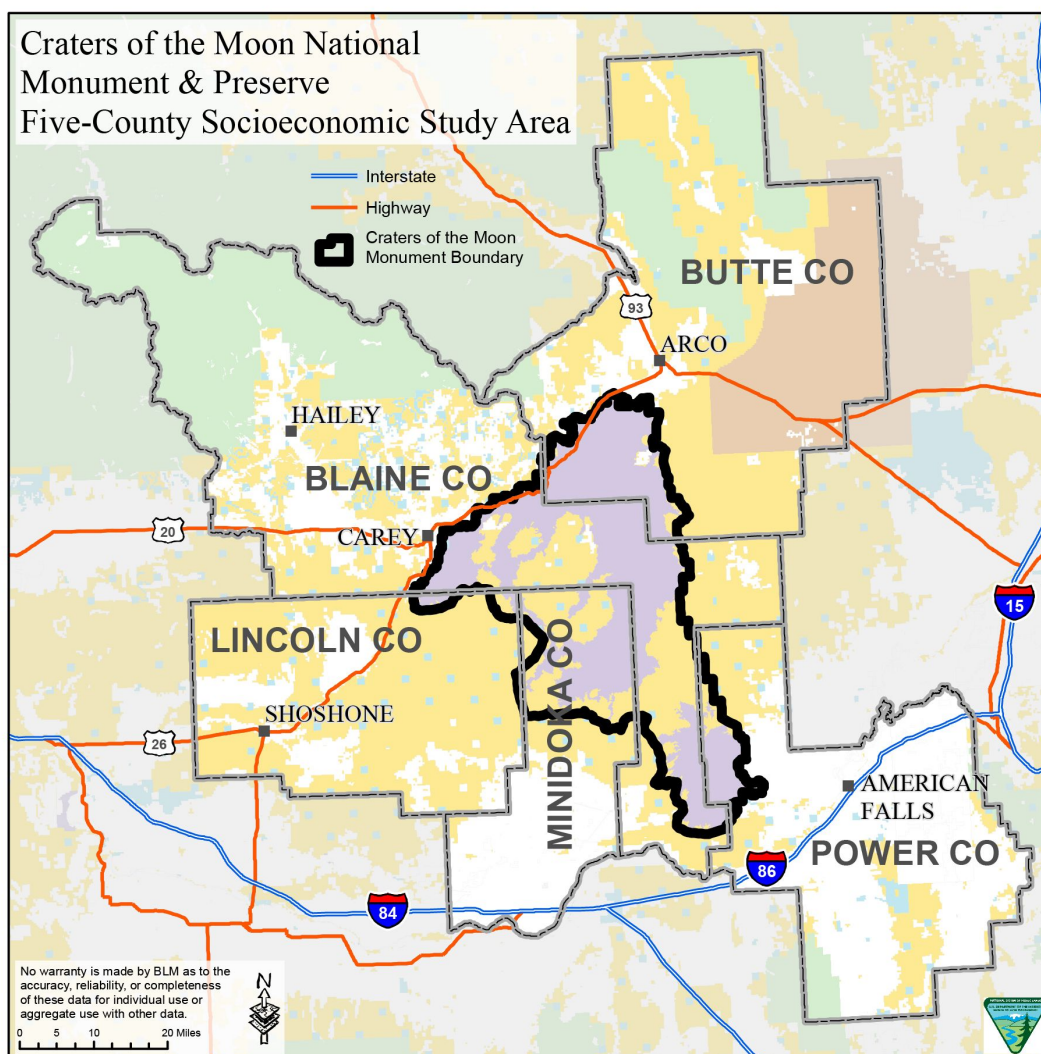
The project area was identified as an Extensive Recreation Management Area (ERMA) in the 2007 MMP. At that time ERMA's were defined as "identified areas where recreation is planned for and

actively managed on an interdisciplinary-basis in concert with other resources/resource programs. ERMA's offer recreation opportunities that facilitate visitors' freedom to pursue a variety of outdoor recreation activities and attain a variety of outcomes." Since then, the BLM's recreation planning policy has been revised and as a result, the definition and management of an ERMA has changed. According to the updated policy, 8320 Planning for Recreation and Visitor Services (R&VS), a designated ERMA is "an administrative unit that requires specific management consideration in order to address recreation use, demand, or R&VS program investments. The ERMA is managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. Management of ERMA areas is commensurate with the management of other resources and resource uses." In order to comply with the current recreation planning policy, the BLM lands within the Monument will be classified as Public Lands Not Designated as Recreation Management Areas. This aligns the recreation management objectives established in the 2007 MMP, which are carried forward in this plan amendment, with the current policy direction. Public Lands Not Designated as Recreation Management Areas are all lands not established as an SRMA (Special Recreation Management Area) or an ERMA. They are managed to meet the basic R&VS and resource stewardship needs. Recreation is not emphasized, however recreation activities may occur except on those lands closed to public use. The R&VS are managed to allow recreation uses that are not in conflict with the primary uses of these lands. The 2007 MMP addresses the current policy requirements for Public Lands Not Designated as Recreation Management Areas which are: (a) visitor health and safety; (b) use and user conflicts; (c) the type(s), activities and locations where special recreation permits would be issued or not issued; and (d) mitigation of recreation impacts on cultural and natural resources.

Visitation to the expanded part of the Monument was estimated at 3,276 visits in 2013, according to BLM's RMIS data. Monument recreation pursuits requiring access include: hunting, driving for pleasure, geologic exploration (including caving, lava hiking, and sightseeing), hiking, primitive camping, photography, horseback riding, and mountain biking. Most recreational access to the expanded Monument area is for the purpose of visiting destination locations in the Monument such as Snowdrift Crater, Wapi Park, Kings Bowl, and Bear Trap Cave. A small number of visitors travel to lesser known locations within the Monument for a variety of recreation purposes. A more in depth description of each recreation opportunity can be found on pages 171-177 of the 2007 MMP EIS.

### **3.3.4. Socioeconomic Values**

The Craters of the Moon National Monument and Preserve falls within a five-county area in Idaho. The counties in which the Monument boundaries lie are Blaine, Butte, Lincoln, Minidoka, and Power (Figure 3.14, Monument and Preserve Five-County Socioeconomic Study Area). For all socioeconomic sections in this document, the term, "Study Area," refers to this five-county area. Due to data availability and the way socioeconomic information is collected and organized, the county level is the smallest quantifiable unit for analysis. The Monument and Preserve inhabit only about 14% of the Study Area (Table 3.9, "Craters of the Moon National Monument and Preserve Area by County").



**Figure 3.18. Monument and Preserve Five-County Socioeconomic Study Area**

**Table 3.9. Craters of the Moon National Monument and Preserve Area by County**

County	County Total Acres	Monument Acres per County	% of Monument per County
Blaine	1,700,338	383,322	23%
Butte	1,435,061	136,632	10%
Lincoln	772,219	17,190	2%
Minidoka	488,427	164,014	34%
Power	924,874	52,085	6%
TOTAL	5,320,918	753,244	14% of the 5 counties is in the Monument

Socioeconomic conditions in these counties have followed roughly the same pattern as the rest of the U.S. in recent years: A long upward trajectory in economic variables such as personal income, employment, and so on was interrupted by the 2007-2009 recession. Although growth

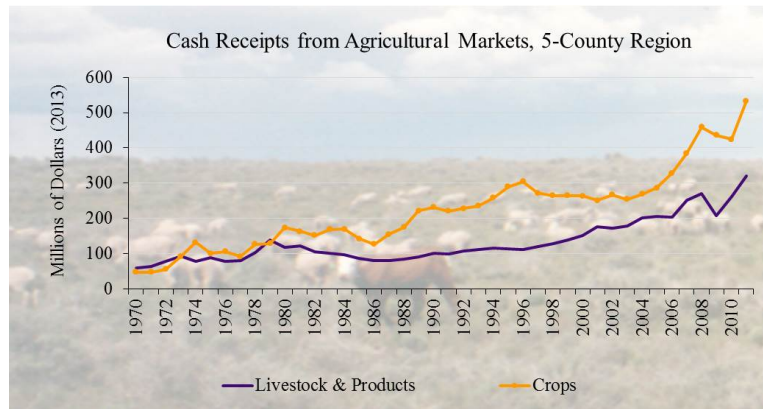
has resumed, the growth rate has slowed from what it was prior to the onset of the recession. In contrast with many other parts of the U.S. and Idaho, the five-county region has experienced net out-migration. In other words, more residents have moved away from the area than have moved to the area. In spite of this out-flow of residents, total population has increased due to local births.

Over time, unearned income (income from investments, rental properties, retirement accounts, etc.) has become an increasingly large source of total income within the five counties, reaching a high of around 45% of all income as of 2009. This implies that the local economy could be enjoying benefits of stability that come with income that is not dependent on the labor market, and it corresponds with an aging population. Ups and downs in employment are less likely to translate into ups and downs in demand for consumer goods and services within the study area. On the other hand, market disruptions that negatively impact asset values at the national level could disproportionately affect the wealth and economic stability of local residents.

From 1970 to 2000, job growth in services, construction, and retail-related industries outpaced growth in every other economic sector in the region. Services industry jobs increased by a much larger number than did jobs in any other industry during those same years, but since 2000, most sectors' employment numbers have remained fairly steady. Personal income in the area has followed the same pattern as that exhibited in the job market: large gains from 1970 to 2000 in the services industry has been followed by more stability in that and other industries since the year 2000. It is important to note that in previous recession and recovery cycles, the region experienced positive job growth during the recovery period. Since the end of the 2007-2009 recession, the five-county region has continued to experience job losses, losing at twice the percentage since 2009 as during the recession itself (5.1% in comparison with 2.5% during the recession). In spite of those negative job growth figures, per capita income and average income per job have both performed well in comparison with the State of Idaho, with per capita income growing at more than 12% from 2000 to 2011, compared with 2% for Idaho as a whole. A recent NPS economic report shows that 200,525 visitors to Craters of the Moon National Monument and Preserve in 2013 spent \$6.6 million in communities near the park. That spending supported 94 jobs in the local area [USDI NPS, 2013].

More than 25% of residents within the five-county region self-identify as Hispanic. This is almost ten percentage points higher than for the U.S. as a whole. The Native American population in the study area is also larger as a proportion of the overall population as compared with the U.S. Poverty rates within the study area are lower than for the U.S. as a whole, another indication that the local economy is somewhat more stable and healthier than the nation's economy.

At 12.5% in 2012, farm earnings as a percentage of total earnings are quite a bit higher in the five-county region than in the U.S., for which the percentage was 1% in the same year. This indicates that agriculture plays a much larger role in the economy in the study area than in the rest of the U.S. Total gross revenue to agriculture has shown strong growth in the past decade, with growth in both crop and livestock-related revenue. In 2007, beef cattle operations comprised nearly 30% of all farm enterprises in the study area.



**Figure 3.19. Cash Receipts from Agricultural Markets, 5-County Region**

### 3.3.5. Climate Change

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and persist for an extended period, typically decades or longer.” It refers to any change in climate over time, whether due to natural variability or as a result of human activity [IPCC, 2007].

The IPCC [Climate Change Supplementary Information Report (SIR), 2010] states, “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.” Global average temperature has increased approximately 1.4°F since the early 20th century [Climate Change SIR, 2010]. Warming has occurred on land surfaces, oceans, and other water bodies, and in the troposphere (the lowest layer of earth’s atmosphere, up to 4-12 miles above the earth). Other indications of global climate change described by IPCC include:

- Rates of surface warming increased in the mid-1970s, and the global land surface has been warming at about double the rate of ocean surface warming since then.
- Eleven of the last 12 years rank among the warmest years on record since 1850.
- Lower-tropospheric temperatures have slightly greater warming rates than the earth’s surface from 1958-2005.

Earth has a natural greenhouse effect wherein naturally occurring gases such as water vapor (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) absorb and retain heat. Without the natural greenhouse effect, earth would be approximately 60°F cooler [Climate Change SIR, 2010]. Current ongoing global climate change is believed by scientists to be linked to the atmospheric buildup of greenhouse gases (GHGs), which may persist for decades or even centuries. Each GHG has a global warming potential that accounts for the intensity of each GHG’s heat trapping effect and its longevity in the atmosphere [Climate Change SIR, 2010]. The buildup of GHGs such as carbon dioxide, methane, nitrous oxide, and halocarbons since the start of the industrial revolution has substantially increased atmospheric concentrations of these compounds compared to background levels. At such elevated concentrations, these compounds absorb more energy from the earth’s surface and re-emit a larger portion of the earth’s heat back

to the earth rather than allowing the heat to escape into space than would be the case under more natural conditions of background GHG concentrations.

A number of sources contribute to the phenomenon of climate change, including emissions of GHGs (especially carbon dioxide and methane) from livestock production, fossil fuel development, large wildfires, activities using combustion engines, changes to the natural carbon cycle, and changes to radiative forces and reflectivity (albedo) [Gerber et al., 2013]. It is important to note that particular types of GHGs will have various sustained climatic impacts over different temporal scales due to their differences in global warming potential (described above) and lifespans in the atmosphere. For example, carbon dioxide proper may last 50 to 200 years in the atmosphere while methane has an average atmospheric life time of 12 years [Climate Change SIR, 2010]. Land uses and/or land management activities that increase the ability of vegetation and soil to sequester carbon can help mitigate the effects of climate change. Such activities include improving/restoring riparian and wetland areas, improving forest age class diversity, health, and resiliency, mitigating the size and intensity of wildfires, and maintaining/improving livestock grazing management.

Activities in Idaho accounted for approximately 28.5 million metric tons (Mt) of gross carbon dioxide equivalent (CO<sub>2</sub>e) emissions in 2011, an amount equal to about 0.4% of total U.S. gross GHG emissions [World Resources Institute, 2014]. Idaho's gross GHG emissions are rising faster than those of the nation as a whole (gross emissions exclude carbon sinks, such as agricultural soils). Idaho's gross GHG emissions increased 51% from 1990 to 2011, while national emissions rose by only 8% from 1990 to 2011 [World Resources Institute, 2014].

In 2011, the principle sources of Idaho's GHG emissions were energy and agriculture, accounting for about 57% and 36% of Idaho's gross GHG emissions, respectively. Within the energy sector, transportation accounted for the majority of emissions [World Resources Institute, 2014].

Current U.S. GHG emissions from livestock total approximately 213 Mt of CO<sub>2</sub>e per year [Environmental Protection Agency (EPA), 2014a]; current U.S. emissions of all GHGs total approximately 6.8 billion metric tons (Bt) of CO<sub>2</sub>e per year [EPA, 2014a]; current global emissions of all GHGs total approximately 43.8 Bt of CO<sub>2</sub>e per year [World Resources Institute, 2014].

Indicators of climate change include temperature, precipitation, snowpack, stream flow, stream temperature, plant phenology, wildfire, and vegetation dynamics [Gillis et al., 2010], all of which continue to change throughout Idaho. A recent study of Idaho meteorological data collected from 1968 to 2008 shows a decrease in precipitation and an increase in temperature across the state [Sohrabi, Ryu, Abatzoglou, & Tracy, 2012]. Within the Monument, trends in temperature and precipitation generally appear to fall within the historical range of variability (1901–2012), although temperature extremes (extreme warm) have occurred [USDI NPS, 2014]; [Monahan & Fisichelli, 2014].

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# **Chapter 4. Environmental Consequences**



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## 4.1. How to Read this Chapter

This chapter provides the scientific and analytic basis for a comparison of the alternatives. Considering the existing environmental condition that would be affected by this MMP Amendment (Chapter 3, *Affected Environment*) along with the alternative descriptions (Chapter 2, *Alternatives*), the types and magnitude of impacts were identified and quantified, to the extent practicable. Regardless of resource or resource use, the BLM is guided by Planning Criteria listed in Appendix C of the BLM Planning Handbook, and, as such, these are not specifically outlined as assumptions.

### 4.1.1. Impact Analysis Descriptors

This chapter describes the direction, extent, and duration of identified impacts or effects. Both impacts and effects are used synonymously. Where quantitative data was not available, impacts are described using ranges of potential impacts or in qualitative terms. Unless otherwise noted, the following qualitative impact thresholds were used for analyzing the intensity of effects on resources or resource uses:

**Negligible:** The resource or resource use would not be affected, or the effects would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence.

**Minor:** The effects on the resource or resource use would be detectable but localized, small, and of little consequence to the resource or use. Mitigating measures, if needed to offset adverse effects, would be simple and successful.

**Moderate:** The effects on the resource or resource use would be readily detectable, but localized. Mitigating measures, if needed to offset adverse effects, would be extensive and probably would be successful.

- For livestock grazing, localized effects would be defined as affecting an allotment, and/or pastures or small portions of multiple allotments.
- For wildlife and fish resources, the action would result in a level of disturbance that causes discernible impairment of the function of an important habitat (a significant reduction in wildlife or fish use is anticipated), but the impacts can often be reduced or eliminated through seasonal use restrictions, implementation of recommended management practices, and/or habitat mitigation. This level of impact can result in a cumulatively significant effect if multiple impacts are present over a large area and are not mitigated.
- For vegetation resources, the effects would be perceptible across a sizable segment of the plant community over a relatively large area. Special status plants could be affected.
- The effect on soil productivity or fertility would be readily apparent and result in a change in the soil character over a relatively wide area.
- The effects would be perceptible across a sizable segment of a riparian community or over a relatively large area containing water resources. Desired conditions would be altered on a short-term basis.

- For Native American Rights and Interests, the impact would be measurable and perceptible. The impact would change one or more characteristics or defining features of trust resources, ethnographic resources, traditional use areas or treaty rights, but does not diminish the integrity of the resource to the extent that it is jeopardized.
- For cultural resources, the impact would be measurable and perceptible. The impact would change one or more character-defining features of an archaeological resource. If the impact diminishes the integrity of the resource to the extent that its NRHP eligibility is jeopardized, the Section 106 determination of effect would be “adverse effect”.

Major: The effects to the resource or resource use would be obvious and would result in substantial consequences to the resource or resource use. Extensive mitigating measures would be needed to offset adverse effects and their success would not be guaranteed.

- For livestock grazing, the effects would be widespread, affecting entire allotments, and/or multiple pastures or large portions of multiple allotments.
- For wildlife and fish resources, the action would result in a level of disturbance that causes substantial impairment or loss of the function of an important habitat even though some animals may still be present in the affected areas. Changes in the abundance or distribution of wildlife or fish may occur to such an extent that a population would not likely return to its previous level. Seasonal use restrictions, implementation of recommended management practices, and/or habitat mitigation are still useful; however, the impact cannot be fully mitigated within the planning area.
- For vegetation resources, the action would cause a considerable effect on native plant populations, including special status plants, and the effects would cover a relatively large area inside and outside the Monument.
- The effect of soil productivity or fertility would be readily apparent and long-term and would substantially change the character of the soils over a large area within and outside of the Monument.
- The action would cause substantial and long-term impairment of water resources over a significant portion of the planning area.
- For Native American Rights and Interests, the impact would be substantial, noticeable, and permanent. The impact would change one or more character-defining features of trust resources, ethnographic resources, traditional use areas, or treaty rights, diminishing the integrity of the resource to the extent that it is no longer able to sustain traditional uses or support the exercise of treaty rights.
- For cultural resources, the impact on archaeological sites would be substantial, noticeable, and permanent. For NRHP eligible or listed archaeological sites, the impact would change one or more character-defining features of an archaeological resource and diminish the integrity of the resource to the extent that it is no longer eligible for listing on the NRHP. For purposes of Section 106, the site’s NRHP eligibility is lost and the determination of effect would be “adverse effect”.

## **4.1.2. Types of Impacts**

Direct, indirect, and cumulative effects will be discussed in this chapter.

Direct effects are caused by the proposed action and occur at the same time and place.

Indirect effects are caused by the proposed action and occur later in time or farther in distance, but are still reasonably foreseeable.

Cumulative effects result from incremental impacts of actions - when added to other past, present, and foreseeable future actions - regardless of what person or agency (federal or non-federal) undertakes those actions.

Direct and indirect impacts are discussed in Section 4.2, “Discussion of Impacts by Resource and Resource Use”. Cumulative impacts are discussed in Section 4.3, “Cumulative Effects”.

## **4.1.3. Direction and Extent of Impacts**

The extent of an impact is described in terms of how much of an area it might affect (scale). The scale is usually described as occurring at either the local level or on a landscape basis. The local level occurs at a specific site or relatively small area, while landscape occurs throughout all or most of the analysis area, and varies by resource or resource use. Unless specifically identified, impacts would be at the local level. For cumulative impacts, the area(s) in which a resource may be affected, the “region of influence,” may differ from the planning area. The region of influence can vary by resource or resource use; limits may be natural features (watershed), political boundaries (county), or resource norms (regional air quality, visual resource viewsheds, and social and economic conditions).

Impacts can be temporary (short-term), long lasting (long-term), or permanent. For this analysis, short-term impacts are defined as those environmental changes, during and following ground-disturbing activities that generally revert to pre-disturbance conditions soon or within a few years, after the disturbance has taken place. Long-term impacts are defined as those that would remain beyond short-term activities.

## **4.1.4. Impact Considerations**

This impact assessment recognized laws, regulations, policies, guidelines, and BMPs or techniques that would generally apply to all future actions. Additionally, no ground-disturbing activities would directly result from approval of this MMP Amendment. Such future activities would require site- or project-specific environmental evaluations prior to their final approval [BLM Manual 1601].

For each resource it is necessary to summarize results to the appropriate extent because of the large volume of data. The descriptions of potential impacts focus on those resources that could be substantially affected or were identified by the public and/or agencies as issues, regardless of the impact, such as biological and vegetative resources. Presented in a general summary are the potential impacts on those resources not substantially affected or not identified as major issues, such as cultural and visual resources. Impacts on these resources would be minimal (negligible to moderate) with only slight differences between alternatives.

For comparison and analysis purposes only, acreage figures, and other measurements used and referred to, are approximate. The BLM only has decision authority on BLM-managed public land, not NPS, private or State lands.

### 4.1.5. Chapter Organization

The potential impacts on each resource/resource use for the alternatives are discussed under four sections. They include a summary/brief comparison of the four alternatives proposing how they would achieve objectives and DFCs. Because the analyses are broad in nature and not all factors that influence how impacts may act on a resource are known, assumptions are made for analytical purposes, and to provide for comparison between alternatives. Since not all resources or resource uses react the same, definitions or time-lines for short- and long-term impacts are identified in each resource or resource use assumption.

In order to limit redundancy and provide clarity, a general discussion on how activities affect resources/resource uses has been developed. It also provides an overview of the management action impacts on a resource and whether it is short- or long-term. The following are examples of impact types:

- Short-term: Fire may remove vegetation required for animal forage in a given year.
- Long-term: It may take decades for sagebrush to recolonize a site where it has been eliminated by fire.

Lastly, the impacts discussion provides analysis of the direction, extent, and duration to which the change agents operate for each alternative. The discussion of impacts works hand-in-hand with management actions, but is not a reiteration of them.

There are several general assumptions for the impact analysis that are common to all alternatives:

- Each alternatives will be implemented in compliance with BLM standard practices, BMPs, design features, guidelines for surface disturbing activities, and mitigation guidelines.
- Soil resources will be managed to meet applicable Standards under all alternatives.
- Comparison of impacts among resources is intended to provide an impartial assessment to inform the decision maker and the public. The impact analysis does not imply or assign a value or numerical ranking to impacts. Actions resulting in adverse impacts on one resource may impart a beneficial impact on other resources.
- Surface disturbances generally increase surface runoff due to an increase in impervious surface, changes in water routing, and loss of vegetation. Surface disturbances can also decrease recharge to aquifers with increases in impervious surface due to compaction, or by transporting water away from areas which have the capability to infiltrate.
- The greater the amount of surface disturbance, the greater the probability that accelerated erosion by wind and water would occur.
- Vegetation restoration projects would eventually be successful on 100 percent of the affected areas. This is for analysis purposes only and may not reflect actual success rates. Meeting stabilization, rehabilitation, and restoration objectives would result in project success.

- Funding would be available to implement the alternatives described in Chapter 2, *Alternatives*.
- The alternatives would be implemented as described in Chapter 2, *Alternatives*.

## **4.2. Discussion of Impacts by Resource and Resource Use**

### **4.2.1. Soil Resources**

#### **4.2.1.1. Summary**

Alternatives A and C would potentially authorize the most livestock grazing, with the largest area available to grazing and the most AUMs authorized. These alternatives will require more intensive monitoring if all AUMs are used to ensure land health standards are met. The impacts of Alternatives A and C on soil resources would be minor, in that they would be a continuation of localized but detectable increases in soil bulk density and erosion in areas of livestock congregation. Increases in the area of the impacts could occur with full permitted use, but the locations would not change.

Alternative B would result in less surface disturbance than Alternatives A, C and E at full implementation, but would have more direct effects than Alternative D because livestock grazing would continue in certain portions of the Monument. Disturbed soils in areas closed to grazing would recover in a shorter amount of time than grazed areas. The impacts of Alternative B would also be minor in that there would be localized improvements in the soil resources with lower livestock congregation. Areas of grazing closure would no longer be affected by livestock grazing.

Alternative D would not have any land available to livestock grazing, this would have the least amounts of impacts related to direct livestock utilization, but would have short-term impacts from removal of infrastructure related to livestock grazing. Alternative D could have increased short-term impacts to soils if increased fence infrastructure is deemed required to keep livestock outside the Monument portions of existing allotments that intersect the boundary. In the long term, livestock traveling the fenceline would have minor effects to the soil resources, and localized impacts within the Monument would no longer occur.

Alternative E would permit about half the AUMs of Alternatives A and C, with a focus on no net increase in soil disturbance from livestock grazing infrastructure. Alternative E would have more impact than Alternatives B and D, but less impact than Alternatives A and C. Alternative E would be a continuation of the current minor impacts to soil resources, but the effects would be lessened compared to Alternatives A and C if fully utilized by livestock.

Projects and permits would have site-specific impacts on soils that are not analyzed in detail at this level of planning, due to implementation-level, variation in effects based on location, duration, timing, and the actual proposed action.

#### **4.2.1.2. Assumptions**

- Information about soils and the response of soils to various actions was compiled from NRCS soil surveys, other agency maps and documentation, relevant literature, and resource experts. The analysis was based on reference information, anticipated effects of management prescriptions by alternative, and professional judgment.

- Soils rated as medium or greater potential for water erosion and moderate or greater potential for wind erosion are more likely to erode than soils rated as having low potential for water erosion and slight potential for wind erosion.
- The type and extent of ground cover as well as the removal or disturbance of that cover affects soil erosion and infiltration rates.
- All alternatives will continue to manage BLM lands toward the resource objective of DFCs and to meet Land Health Standards.

#### **4.2.1.3. How Activities Affect Soil Resources**

##### ***Water Resources Management Actions***

Soils associated with riparian areas have unique characteristics that contribute to the functionality of the system [USDI BLM, 2006]. Striving to maintain or achieve PFC, protection, and restoration of these areas helps to improve soil quality and overall function of the riparian system.

##### ***Vegetation Resources Management Actions***

Vegetation management actions are intended to improve or maintain the health of the current plant communities and provide habitat for wildlife. Uses and disturbance can lead to soil loss and site degradation, or can contribute to increases in plant health and increased soil retention and improvement. Managing for improved or maintained vegetation conditions would also protect or maintain the soil resources.

##### ***Wildlife and Fish Resources Management Actions***

Wildlife management actions are intended to improve or maintain habitat conditions in the Monument. Construction or maintenance related to projects that will help achieve those goals may impact soils in the short term through soil compaction and disturbance, the extent of which depends on the timing and duration of the activity. However, if spatial restrictions to livestock use were put into place to benefit wildlife and their habitats, then those restricted areas would benefit soils by limiting ground-disturbing activities.

##### ***Livestock Grazing Management Actions***

Livestock grazing can be a surface-disturbing activity, ranging from negligible to moderate disturbance impacts from uses and infrastructure associated with the activity. Direct impacts to soil from livestock grazing include compaction of soil, reduced infiltration, and increased erosion potential. Livestock grazing can affect soils by removing vegetation cover and trampling. The extent of these effects can vary by season of use, soil moisture content while being grazed, and duration of use. Season of use could extend across spring, summer, fall, and winter. Trampling can create a physical soil crust, which reduces water infiltration [Belnap, 2003]. Biological soil crusts are an important biotic component of soils, contributing to nutrient cycling and protection of soils. Livestock grazing can affect biological soil crusts, soil microtopography, and aggregation by trampling and disturbing crusts, although the degree of impacts vary depending on timing, intensity, and duration of use. Stable aggregates at the soil surface help maintain infiltration capacity by limiting physical crusting and blockage of surface connected macropores during storms. Also, aggregated pores contribute to water storage capacity, as well as water transmission through the soil [Herrick, 1999].

Soil bulk density is a factor that affects soil texture, air and water capacity of the soil, and root development potential. Although natural soil composition factors affect soil bulk density, it can also be affected by disturbances such as livestock use. Livestock concentration areas are an example of a location that would likely exhibit increased soil bulk density. This can lead to decreases in water infiltration, reduced porosity, increased runoff, and reduced or more difficult conditions for plant root development.

Erosion is related to vegetation cover and structure [Herrick et al., 2005]. A correlation exists between the presence of herbaceous cover of varying heights to wind speed. Greater wind speeds were recorded in areas where herbaceous cover had been removed or greatly reduced, which in turn increased the amount of soil erosion from wind [Sankey, Germino, & Glenn, 2009]. Soil compaction potential is increased on fine soils. Soil compaction can be caused by mechanical disturbances, such as from driving, heavy grazing, and off-highway vehicle use. Freeze and thaw cycles help naturally alleviate compaction in rangeland soils, as does avoidance of disturbance while soils are saturated.

Livestock grazing management actions include the removal, maintenance, or creation of infrastructure, such as water sources and fences. These activities may affect soils in the short-term, with negligible to moderate impacts, including compaction from equipment, or increased susceptibility to water or wind erosion from removal or reduction of vegetative cover. Long-term effects to the soils resource are evidenced from the maintenance or creation of infrastructure, and may be negligible to moderate. These impacts include localized shifts in vegetation composition from maintenance activities or livestock congregation, and sustaining compaction and areas susceptible to erosion. Increases to grazing use, in general, can reduce the amounts of litter available in the system [Shariff, Biondini, & Grygiel, 1994]. Litter can provide soil protection through dispersing direct impacts from precipitation to bare mineral soil, and can increase percolation and retention of moisture in the soil profile. Continuing to, or achieving Standards would help reduce impacts to soils from livestock grazing.

#### **4.2.1.4. Discussion of Impacts by Alternative**

##### **Soils: Alternative A**

##### ***Water Resources Management Actions***

Soils associated with riparian areas have unique characteristics that contribute to the functionality of the system [USDI BLM, 2006]. Striving to maintain/achieve PFC, protection, and restoration of these areas would help to improve the soil characteristics and overall function of the system.

There would be no changes to water resource management actions in Alternative A.

##### ***Vegetation Resources Management Actions***

Existing vegetation management actions are intended to improve or maintain the health of the current plant communities and provide habitat for wildlife. Uses and disturbance can lead to soil loss and site degradation, or can contribute to increases in plant health and increased soil retention and improvement. Continuing to manage for improved or maintained vegetation conditions would protect or maintain the soils resource.

There would be no changes to vegetation resource management actions in Alternative A.



***Wildlife and Fish Resources Management Actions***

Scheduling construction and maintenance activities to avoid or minimize disturbance to certain wildlife and habitats in the Monument could impact soils either negatively or positively depending on the timing of the activity. Wet soils are more prone to compaction related to equipment used for maintenance and construction. However, if spatial or temporal restrictions were enforced, then those soils would benefit from the limit to ground-disturbing activities during a time of year when soils are more likely to be saturated and susceptible to compaction.

***Livestock Grazing Management Actions***

Livestock grazing would continue across the Monument as authorized in the past. Actual use has averaged 11,791 AUMs over the past 15 years, with a high use of 19,388 AUMs but could increase to the full allocation of AUMs, which is 38,187. The full allocation would continue to be dispersed use, but could potentially increase the amount of soil disturbance and compaction associated with livestock infrastructure due to increased use and pressure. Impacts could continue, and would be addressed and managed to meet Standards at the implementation level during the permit renewal process. Roughly 1,200 acres would be unavailable for livestock grazing under Alternative A (See Table 2.3, “Relative Comparison of Impacts Among Alternatives” in Chapter 2).

Livestock concentration areas would likely have higher soil erosion and soil bulk density than dispersed-use areas. Higher use levels would increase the overall potential for soil erosion and bulk density. Timing and intensity would also affect soils; for instance, consistent use on wet soils would result in an increase in soil compaction.

***Soils: Alternative B******Water Resources Management Actions***

The water resources management actions would allow suspension or modification of livestock grazing to occur if livestock grazing is determined to be a factor in not meeting riparian or watershed Standards, following LHAs. Soils are a critical component of functionality in a riparian system, and also considered a resource to protect. Typically, an adequate vegetation component can help to protect the soil resource by dispersing overland flows, trapping sediment, and stabilizing and protecting banks [USDI BLM, 2006]. Unsuitable timing and duration of livestock grazing could be a causal factor in an area not meeting PFC. If determined to be a factor, adaptive changes to grazing management would help protect the soils resource in areas not meeting PFC.

Springs would not be developed under Alternative B. This would eliminate soil disturbing activities associated with spring development and protect the resource.

Improvement and enhancements to water systems for the benefit of wildlife habitat and vegetation (Sections 4.2.2.3 and 4.2.2.4) would protect the soil resource across the landscape, although modifications to enhance the functionality or remove unneeded systems may have short-term negligible to moderate impacts to soils.

***Vegetation Resources Management Actions***

Under Alternative B, grazing would prioritize utilization on non-native perennial seedings. This would reduce grazing pressures on soils in native areas, but would increase impacts to soils in seeded areas. Grazing can increase soil compaction when concentrated or heavy use is allowed, and can also contribute to physical soil crusts, which can restrict water infiltration and seed

germination. However, grazing would be authorized at a greatly reduced level from Alternative A, so grazing is anticipated to be more dispersed, except on non-native seedings, and overall, have less of an impact on the soils resource. Alternative B would continue to strive to achieve Standard 5 (Seedings), which includes ensuring rangeland seedings are “functioning to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle” [USDI BLM, 1997].

### ***Wildlife and Fish Resources Management Actions***

Impacts from wildlife and fish resources management actions are the same as discussed in Alternative A.

### ***Livestock Grazing Management Actions***

Lands available for livestock grazing would be reduced to 253,700 acres and AUMs would be decreased across the entire Monument. This would lead to a decreased impact to soils from livestock grazing. Grazing reductions would either eliminate or further disperse utilization across the landscape, therefore reducing grazing-related soils issues such as compaction within lands closed to grazing. Long-term reduced impacts to soils related to livestock infrastructure would also result from less utilization, although grazing management through rest and deferment can also reduce impacts at higher stocking rates.

New livestock developments would not be allowed in areas closed to grazing. This would eliminate the impacts to soils associated with developments, such as soil disturbance and compaction. Livestock developments are associated with use concentration areas, and typically cause greater soil compaction than natural conditions. Removal, consolidation, or modification with the intention of benefitting wildlife would also provide a net overall benefit for the soil resource. Avoiding placement of concentration areas near sensitive cultural resources would help protect these resources by dispersing use, and indirectly conserve the soils. Management actions under Alternative B would influence livestock concentration away from playas and protect soil structures that are unique to playas.

Under Alternative B, the Kimama Allotment would gain 40 acres of non-Monument lands. Poison Lake Allotment would gain nearly 800 acres of Monument lands. Shifts to the allotment boundaries are likely to incur similar impacts as current management to soils through utilization by livestock.

Modifications of livestock management through a variety of practices, including changes in timing, duration, and intensity, allows for flexibility to achieve DFCs for habitat, of which soils are an underlying component. Soils can be affected either negatively or positively through a variety of management actions, including adjusting timing of use, stocking rate, scheduling rest, or deferment, livestock numbers, kind, and distribution. Impacts to soils from adjusting livestock management to achieve DFCs for habitat include increasing residual cover on a landscape level, which would reduce the potential for erosion. When livestock grazing is appropriately managed, it can provide an opportunity to alleviate soil compaction through natural processes. However, certain areas may continue to receive or see an increase in localized impacts from changes to livestock management that may be necessary to facilitate achievement of DFCs. For instance, shifting grazing from a native vegetation area in good condition to a non-native perennial seeding to facilitate residual cover for wildlife values may also cause an increase in erosion potential or compaction in the seeding. The extent of impacts on the soil resources from modifications to livestock management depend on timing, intensity, and duration of grazing, and would be

negligible across the landscape, but could be negligible to moderate in localized areas. These impacts would be related to achieving DFCs, and would be implemented to produce a net benefit to impacted resources across the landscape.

Winter livestock grazing could occur across the Monument under Alternative B. Vegetation is important in the winter for snow capture to aid in retention and incorporation of winter moisture into the soil profile. Winter use can improve dispersal through cooler temperatures and improved natural water availability, which disperses impacts to soils when saturated. However, this is limited during severe weather and extreme temperatures, which can cause livestock to congregate on available feed and water areas, and cause direct impacts to soils through trampling and compaction. Compaction affects nutrient uptake, soil porosity, moisture availability, and root development for plants. Degrees of compaction and extent would vary depending on stocking rate and repeated use of an area. Areas that are heavily used when soils are saturated would be more likely to exhibit compaction than areas that are lightly to moderately used, with rest or deferment to allow for natural processes, such as freezing and thawing, to alleviate any compaction issues. Also, in light to moderately used areas, compaction issues would likely be limited to localized effects in areas of livestock congregation, such as near water or mineral sources. Soil surface microrelief is also correlated to infiltration, so areas that are heavily trampled could see reduced infiltration rates [Warren, Thurow, Blackburn, & Garza, 1986].

Alternative B would avoid livestock utilization in spring or early summer in sage-grouse nesting or early brood-rearing habitats, although spring livestock grazing could occur across the rest of the Monument. This alternative would eliminate or reduce impacts from livestock grazing on soils within GRSG breeding and brood rearing habitat, during spring and early summer, a time of year when saturation is common. Soils are typically saturated at this time through retained winter moisture and renewed spring rainfall. Plants are utilizing available soil moisture to initiate growth as soil temperatures increase. During this time, soils are more prone to compaction, increased soil bulk density, and reduced porosity, which can, in turn, restrict root growth and reduce soil water holding capacity. Cool temperatures and improved natural water availability can improve livestock distribution, reducing impacts from livestock congregation to become negligible to slight, and widespread. These restrictions would also reduce impacts to soils at concentrated-use areas in close proximity to leks by restricting livestock use.

Summer livestock grazing could occur across the Monument under Alternative B. Summer in the planning area is associated with hotter and drier conditions and the completion of plant growth cycles. Drier conditions can reduce the potential for soil compaction as compared to wetter conditions, but can also increase livestock congregation due to reduced water availability and hotter conditions. Summer conditions also reduce the distance that livestock will travel between forage and water sources. Loafing in congregation areas by livestock increases, which can cause soil erosion and compaction.

Fall livestock grazing could occur across the Monument under Alternative B. This season provides a mix between summer season impacts and winter season impacts. Plants have mostly completed growth cycles, so water uptake is minimal at this time. Soils are drier, but conditions are typically cooler than summer months, but also warmer and milder than winter conditions. Cool temperatures improve livestock distribution, creating a situation in which livestock are more inclined to range in order to forage, which disperses impacts to soils. However, natural water availability is limited depending on fall precipitation, and could limit distribution more than typically seen in spring conditions. At the end of fall, soils typically begin to become saturated, and could experience the impacts discussed under winter grazing.

Retiring an allotment would essentially make the area unavailable for grazing for the life of the plan. This could impact the soil resource, from negligible to moderate by eliminating the potential for impacts to the soil resource from livestock grazing, but would depend on the current condition, and if all or part of the permits for an allotment were retired.

Vegetation is affected during drought by insufficient soil moisture [NRCS, 2004]. Taking management precautions and measures during drought will help retain adequate vegetation cover to protect soils from erosion, allowing for a negligible impact on soils by livestock during drought.

Conversion in kind of livestock is allowed in this alternative. Different types of livestock utilize forage in different manners, and can have different impacts to soils. A different kind of livestock may have a positive effect on soil condition that may not be realized through the currently authorized livestock kind.

### **Soils: Alternative C**

#### ***Water Resources Management Actions***

Water management actions impacts in Alternative C would be the same as Alternative A.

#### ***Vegetation Resources Management Actions***

Alternative C is similar to Alternative B by directing grazing to prioritize utilization on non-native perennial seedings and would have the additional goal to target grazing for sagebrush recovery in these seedings. This may impact soils in the short term through removal of vegetation, but timing of grazing could be administered to have minimal impacts to soils. For instance, avoiding direct grazing within a localized area would reduce or minimized impacts to those soils during the period of soil saturated.

Identifying and implementing reference areas to study the effects of livestock grazing on vegetation would also allow an opportunity to see effects on soil resources. Areas where grazing is excluded would reduce impacts to soils, but areas where grazing is changed to meet the objectives of the study may have negligible to moderate impacts to the soils. Exclosures may have short-term moderate, localized impacts to soils from disturbance from the required infrastructure to create the exclosures.

#### ***Wildlife and Fish Resources Management Actions***

Impacts from wildlife and fish resources management actions on soil resources would be the same as discussed in Alternative A.

#### ***Livestock Grazing Management Actions***

Livestock management actions related to protection or maintenance of wildlife habitat would indirectly affect the conservation and protection of the soil resource through temporal and spatial restrictions. However, the degree of the impacts depend on timing, intensity, and duration of grazing. Livestock grazing could authorize up to 37,792 AUMs on 273,600 acres. Roughly 1,500 acres would be unavailable for grazing under Alternative C. These management actions provide more use across a larger portion of the planning area than Alternative B but the use and lands available are comparable to Alternative A. Management actions within Alternative E allow similar acreage as in Alternatives A and C, but with less AUM's available and no net gain of disturbance from livestock related infrastructure. It also would have more long-term impacts

to soils than Alternative D, since Alternative D does not make any lands in the Monument available for grazing. If necessary, livestock grazing would be adjusted to meet Standards, of which soil stability is a major component. Livestock use at the full permitted use levels would decrease residual vegetation and herbaceous litter, leaving soils more susceptible to impacts from erosion. Areas exposed to moderate to heavy livestock grazing typically have less litter than areas subject to light or no grazing [Shariff et al., 1994]. However, adjustments to timing, duration, and intensity could lead to a negligible to minor increase in impacts to soils, when compared to Alternative A. Impacts would likely be moderate at a localized level, such as around concentrated use areas associated with salt and water sources, and negligible to minor at a landscape level.

Livestock developments would be allowed only if they are of neutral or net benefit to sage-grouse. Use concentration areas are associated with livestock developments, and typically cause greater soil compaction than natural conditions. Removal, consolidation, or modification with the intention of having a neutral impact or benefitting wildlife would provide an indirect overall benefit for the soil resource, although short-term moderate impacts would be associated with removal and modification of range improvements. Long-term impacts immediately in the vicinity of improvements would remain, ranging from negligible to moderate soil disturbance or compaction. Any changes to range improvements would be evaluated during LHAs. Removing range improvements would have a long-term impact to soils in those areas by removing localized soil disturbance related to maintenance and use, but may increase concentration at remaining improvements, increasing the impacts to soils in those specific locations.

Alternative C would avoid livestock utilization in spring or early summer in sage-grouse nesting or early brood-rearing habitats, when possible, although spring livestock grazing could occur across the rest of the Monument. This would reduce impacts from livestock grazing on soils during a time of year where saturation is common. Soils are typically saturated at this time through retained winter moisture and wetter periods of spring rainfall. Plants are utilizing available soil moisture to initiate growth as soils warm. During the spring and early summer, soils are more prone to compaction, which results in increased soil bulk density, and reduced porosity. These changes can subsequently restrict root growth and reduce infiltration and soil water holding capacity. Cool temperatures and improved natural water availability can improve livestock distribution, reducing impacts from livestock congregation to become negligible to slight, and widespread. Duration and extent of these effects vary with the soil texture. Coarse-textured soils are able to more rapidly reduce compaction and increase porosity when exposed to natural processes, such as freeze-thaw cycles [Long, Quinn-Davidson, & Skinner, 2014]. These restrictions would also reduce impacts to soils at concentrated-use areas in close proximity to leks by restricting livestock use. This is similar to Alternative B, but would potentially allow more impacts to soils because grazing could still be allowed if scheduling changes are determined to not be practical, from a grazing administration aspect.

Winter livestock grazing could occur across the Monument under Alternative C. Vegetation is important for snow capture to aid in retention and incorporation of winter moisture into the soil profile. Winter use can improve livestock dispersal through cooler temperatures and improved natural water availability, which disperses impacts to saturated soils. However, this response is limited during severe weather and extreme temperatures, which can cause livestock to congregate at available feed and water areas, and cause localized, direct impacts to soils through trampling and compaction. Compaction affects nutrient uptake, soil porosity, moisture availability, and root development for plants. Degrees of compaction and extent would vary depending on stocking rate and repeated use of an area. Areas that are heavily used when soils are saturated would be more likely to exhibit compaction than areas that are lightly to moderately used, with rest or deferment

to allow for natural processes to alleviate any compaction issues. Also, in light to moderately used areas, compaction would likely be limited to localized areas of livestock congregation, such as near water or mineral sources. Soil surface microrelief is correlated to infiltration, as well, so areas that are heavily trampled could see reduced infiltration rates [Warren et al., 1986].

Summer livestock grazing could occur across the Monument under Alternative C. Summer in the planning area is associated with hotter and drier conditions and the completion of plant growth cycles. Drier conditions can reduce the potential for soil compaction as compared to wetter conditions, but can also increase livestock congregation due to reduced water availability and hotter conditions. Summer conditions also reduce the distance that livestock will travel between forage and water sources. The frequency of loafing increases during the summer, which can cause soil erosion and compaction, at a localized level, through increased livestock use at congregation areas.

Fall livestock grazing could occur across the Monument under Alternative C. This season provides a mix between summer season impacts and winter season impacts. Plants have mostly completed growth cycles, so water uptake is minimal at this time. Soils are drier, but conditions are typically cooler than summer months, but remain warmer and milder than winter conditions. Cool temperatures improve livestock distribution, creating a situation in which livestock are more inclined to range in order to forage, which disperses impacts to soils. However, natural water availability is limited depending on fall precipitation, and could limit distribution more than typically seen in spring conditions. At the end of fall, soils typically begin to become saturated, and could experience the impacts discussed under winter grazing.

Vegetation is affected during drought by insufficient soil moisture [NRCS, 2004]. Taking management precautions and measures during drought will help retain adequate vegetative cover to protect soils from erosion and degradation, allowing for a negligible impact on soils by livestock during and after drought. The general approach of Alternatives B, C, and E in regard to vegetation management during drought conditions is similar. However, Alternative B is more focused on ameliorating impacts to sage-grouse habitat while Alternative C is aimed at promoting overall vegetative resilience. Alternative E reduces impacts to sage-grouse habitat though not to the extent of Alternative B while decreasing soil disturbance with no net gain of livestock infrastructure.

Other livestock grazing management actions impacts would be the same between Alternatives B, C, and E.

#### **Soils: Alternative D**

##### ***Water Resources Management Actions***

Water management actions impacts in Alternative D would be the same as Alternative B.

##### ***Vegetation Resources Management Actions***

No new vegetation management actions are identified in Alternative D.

##### ***Wildlife and Fish Resources Management Actions***

Impacts from wildlife and fish resources management actions would be the same as discussed in Alternative A.

### ***Livestock Grazing Management Actions***

No BLM lands in the Monument would be available for livestock grazing in Alternative D. Current livestock use authorizations would continue for two years following the signing of the ROD, so short-term current impacts to soils would continue as related to livestock grazing.

Livestock grazing would not be authorized in Laidlaw Park under Alternative D. This area has a variety of soil types and temperature, elevation, and precipitation gradients. For instance, the south end of Laidlaw Park has mesic, sandy-loam soils at roughly 4,500 feet elevation, and receives 10-12 inches of precipitation yearly. In comparison, the north end of Laidlaw Park is comprised of frigid, loamy soils, roughly 5,500 feet elevation, and averages 12-16 inches of precipitation per year. Responses to no grazing across Laidlaw Park would be the same as the effects of no grazing described for the remainder of the Monument.

Winter livestock grazing would not be allowed across the Monument under Alternative D. Vegetation is important in the winter for snow capture to aid in retention and incorporation of winter moisture into the soil profile. Winter use can improve dispersal through cooler temperatures and improved natural water availability, which disperses impacts to soils when saturated. However, this is limited during severe weather and extreme temperatures, which can cause livestock congregation to available feed and water areas, and cause direct impacts to soils through trampling and compaction. Compaction affects nutrient uptake, soil porosity, moisture availability, and root development for plants. Soil surface microrelief is correlated to infiltration, as well, so areas that were heavily trampled could see improved infiltration rates, although this may not be evidenced for several years, until an episodic event remedied the current condition [Warren et al., 1986].

Under Alternative D, spring livestock grazing would not be allowed across the Monument. Soils are typically saturated at this time through retained winter moisture and renewed spring rainfall. Plants are utilizing available soil moisture to initiate growth as soils warm. This alternative would eliminate or reduce impacts from livestock grazing on soils during a time of year when saturation is common. Saturated soils are susceptible to impacts, including compaction and reduction in soil porosity. Livestock restrictions under Alternative D would also reduce impacts to soils at concentrated-use areas in close proximity to leks.

Summer livestock grazing would not be authorized across the Monument. Summer in the planning area is associated with hotter and drier conditions and the completion of plant growth cycles. Drier conditions can reduce the potential for soil compaction as compared to wetter conditions, but can also increase livestock congregation due to reduced water availability and hotter conditions. The conditions also reduce travel by livestock to forage at greater distances from water sources. Loafing increases, which can cause soil erosion and compaction. However, these impacts would not occur since livestock grazing would not be authorized in the Monument.

Fall livestock grazing would not be authorized across the Monument. This season provides a mix between summer season impacts and winter season impacts. Plants have mostly completed growth cycles, so water uptake is minimal at this time. Soils are drier, but conditions are typically cooler than summer months, while warmer and milder than winter conditions.

Access to private and State inholdings would continue, and developments on these lands would remain. Removing infrastructure from BLM lands associated with livestock grazing would have short-term moderate to major widespread effects on soils, and would require restoration to reduce effects beyond the short-term. Total removal of infrastructure would result in soil disturbance

that may be site specific, but effects would be across the entire area. Soil disturbance results in exposed soil that can be susceptible to erosion, and creates a prime opportunity for noxious weeds and invasive plant species to establish, which can alter soil chemistry, shift plant composition, and increase susceptibility to erosion. It is assumed that following infrastructure removal, restoration would be successful, but long-term efforts would still be needed to ensure that impacts, which could be negligible to moderate, to soils from implementation of Alternative D would continue to diminish over the life of the plan. If fencing is used to restrict livestock movement into areas made unavailable, this would also result in short-term negligible to moderate impacts. Moderate impacts would likely be restricted to site-specific improvements, such as cattleguards, which are necessary to continue to facilitate the visitor use aspect of the Monument. Noxious weeds and invasive plant species may establish and increase in these new disturbance areas, as well as dust. Indirect effects include more soil disturbance potential due to livestock shifts in use from unavailable portions of allotments to areas outside of the Monument that remain available.

Restricting new livestock developments in the Monument would eliminate related impacts to soils in the Monument. This change may shift livestock use to allotments outside of the Monument, which would indirectly increase impacts to the soil resource in areas that experience more livestock use. Removing spring developments when determined to be a causal factor in the spring not achieving potential would result in short-term moderate impacts to soils. This could include increased sedimentation in the spring system and potential establishment or expansion of noxious weeds and invasive plant species. Initial surface disturbance of removing infrastructure will cause negative soil impact but would then return to equilibrium with a high potential of achieving DFC.

#### **Soils: Alternative E**

##### ***Water Resources Management Actions***

Impacts under Alternative E would be the same as Alternative C.

##### ***Vegetation Resources Management Actions***

Alternative E is similar to Alternatives B and C by directing grazing to prioritize utilization on non-native perennial seedings and would have the additional goal to target grazing for sagebrush recovery in these seedings. This may impact soils in the short term through removal of vegetation, but timing of grazing could be administered to have minimal impacts to soils. For instance, avoiding direct grazing within a localized area would reduce or minimize impacts to those soils during the period of soil saturation.

Identifying and implementing reference areas to study the effects of livestock grazing on vegetation would also allow an opportunity to see effects on soil resources. Areas where grazing is excluded would reduce impacts to soils, but areas where grazing is changed to meet the objectives of the study may have negligible to moderate impacts to the soils. Exclosures may have short-term moderate, localized impacts to soils from disturbance from the required infrastructure to create the exclosures.

##### ***Wildlife and Fish Resources Management Actions***

Impacts from wildlife and fish resources management actions on soil resources would be the same as discussed in Alternative A.

##### ***Livestock Grazing Management Actions***



Livestock management actions related to protection or maintenance of wildlife habitat would indirectly affect the conservation and protection of the soil resource through temporal and spatial restrictions. However, the degree of the impacts depend on timing, intensity, and duration of grazing. Livestock grazing could authorize up to 19,388 AUMs on 272,800 acres. Roughly 2,200 acres would be unavailable for grazing under Alternative E. These management actions provide more use across a larger portion of the planning area than Alternative B. It also would have more long-term impacts to soils than Alternative D, since no lands in the Monument are available to grazing in Alternative D. If appropriate, livestock grazing would be adjusted to meet Standards, of which soil stability is a major component. Areas exposed to moderate to heavy livestock grazing typically have less litter than areas subject to light or no grazing [Shariff et al., 1994]. However, adjustments to timing, duration, and intensity could lead to a negligible to minor increase in impacts to soils, when compared to Alternative A. Impacts would likely be moderate at a localized level, such as around concentrated use areas associated with salt and water sources, and negligible to minor at a landscape level.

New livestock developments would only be allowed within existing disturbance areas unless offset by rehabilitating other disturbed areas. Disturbance buffers for fence development must be within 20 feet of the center of primitive roads and 30 feet from the center of roads, or within a previously disturbed area. Troughs and wells must be within historically use or existing watering sites, while corrals must be within historically used corral sites. This would eliminate the impacts to soils associated with new range improvements, including soil disturbance, compaction, and also protect of soil structures that are unique to playas.

Removal, consolidation, or modification with the intention of having a neutral impact or benefitting wildlife would provide an indirect overall benefit for the soils resource, although short-term moderate impacts would be associated with removal and modification of range improvements. Long-term impacts in the immediate vicinity of improvements would remain, ranging from negligible to moderate soil disturbance or compaction. Any changes to range improvements would be evaluated during LHAs. Removing range improvements would have a long-term impact to soils in those areas by removing localized soil disturbance related to maintenance and use, but may increase concentration at remaining improvements, increasing the impacts to soils in those specific locations.

Under Alternative E, the Kimama Allotment would gain 40 acres of non-Monument lands. Poison Lake Allotment would gain nearly 800 acres of Monument lands. Shifts to the allotment boundaries are likely to incur similar impacts as current management to soils through utilization by livestock.

Alternative E would avoid livestock utilization in spring or early summer in sage-grouse nesting or early brood-rearing habitats, when possible, although spring livestock grazing could occur across the rest of the Monument. This would reduce impacts from livestock grazing on soils during a time of year where saturation is common. Soils are typically saturated at this time through retained winter moisture and renewed spring rainfall. Plants are utilizing available soil moisture to initiate growth as soils warm. During the spring and early summer, soils are more prone to compaction, which results in increased soil bulk density, and reduced porosity. These changes can subsequently restrict root growth and reduce infiltration and soil water holding capacity.

Cool temperatures and improved natural water availability can improve livestock distribution, reducing impacts from livestock congregation to become negligible to slight, and widespread. Duration and extent of these effects vary with the soil texture. Coarse-textured soils are able to

more rapidly reduce compaction and increase porosity when exposed to natural processes, such as freeze-thaw cycles (Long, Quinn-Davidson, & Skinner, 2014). These restrictions would also reduce impacts to soils at concentrated-use areas in close proximity to leks by restricting livestock use. This is similar to Alternative B, but would potentially allow more impacts to soils because utilization could still be allowed if grazing scheduling changes are determined to not be practical, from a grazing administration aspect.

Winter livestock grazing could occur across the Monument under Alternative E. Vegetation is important for snow capture to aid in retention and incorporation of winter moisture into the soil profile. Winter use can improve livestock dispersal through cooler temperatures and improved natural water availability, which disperses impacts to saturated soils. However, this response is limited during severe weather and extreme temperatures, which can cause livestock to congregate at available feed and water areas, and cause localized, direct impacts to soils through trampling and compaction. Compaction affects nutrient uptake, soil porosity, moisture availability, and root development for plants. Degrees of compaction and extent would vary depending on stocking rate and repeated use of an area. Areas that are heavily used when soils are saturated would be more likely to exhibit compaction than areas that are lightly to moderately used, with rest or deferment to allow for natural processes to alleviate any compaction issues. Also, in light to moderately used areas, compaction would likely be limited to localized areas of livestock congregation, such as near water or mineral sources. Soil surface microrelief is correlated to infiltration, as well, so areas that are heavily trampled could see reduced infiltration rates [Warren et al., 1986].

Summer livestock grazing could occur across the Monument under Alternative E. Summer in the planning area is associated with hotter and drier conditions and the completion of plant growth cycles. Drier conditions can reduce the potential for soil compaction as compared to wetter conditions, but can also increase livestock congregation due to reduced water availability and hotter conditions. Summer conditions also reduce the distance that livestock will travel between forage and water sources. The frequency of loafing increases during the summer, which can cause soil erosion and compaction, at a localized level, through increased livestock use at congregation areas.

Fall livestock grazing could occur across the Monument under Alternative E. This season provides a mix between summer season impacts and winter season impacts. Plants have mostly completed growth cycles, so water uptake is minimal at this time. Soils are drier, but conditions are typically cooler than summer months, while remaining warmer and milder than winter conditions. Cool temperatures improve livestock distribution, creating a situation in which livestock are more inclined to range in order to forage, which disperses impacts to soils. However, natural water availability is limited depending on fall precipitation, and could limit distribution more than typically seen in spring conditions. At the end of fall, soils typically begin to become saturated, and could experience the impacts discussed under winter grazing.

Vegetation is affected during drought by insufficient soil moisture [NRCS, 2004]. Taking management precautions and measures during drought will help retain adequate vegetative cover to protect soils from erosion and degradation, allowing for a negligible impact on soils by livestock during and after drought. The general approach of Alternative B, C and E in regard to vegetation management during drought conditions is similar. However, Alternative B is more focused on ameliorating impacts to sage-grouse habitat while Alternative C is aimed at promoting overall vegetative resilience. Alternative E reduces impacts to Sage Grouse habitat not to the extent of Alternative B while decreasing soil disturbance from no net gain from livestock infrastructure.

Other livestock grazing management actions would be the same as Alternatives A and C.

## **4.2.2. Water Resources**

### **4.2.2.1. Summary**

It is anticipated that most activities on public lands have the potential to affect water resources. Adverse impacts are generally described as surface-disturbing activities that could affect the functionality of water resources by removing vegetation, compacting hydric soils, or diverting the water source. Effects to water quality would primarily occur through actions that increase runoff, sedimentation, or nutrients. Conversely, beneficial impacts result from management actions that protect or restore water resources. The analysis boundary for water resources is defined as the Monument boundary (planning area) but also considers overlapping allotments and coinciding watersheds. This area would account for any effects attributed to livestock grazing management in the Monument that could result in a change in surface water conditions or riparian-wetland functionality.

Alternative A proposes the most acres of land available to livestock grazing and no change to permitted AUM levels. Alternative A would likely meet objectives and DFCs for the planning area because riparian areas and wetlands would be maintained, restored, or enhanced over the long term. Managing for Idaho Standards for Rangeland Health and Proper Functioning Condition would have a slight landscape-level benefit to water resources. However, the lack of implementation-level guidance concerning livestock grazing management in Alternative A could result in minor adverse impacts to water resources because short-term degradation would likely occur in localized areas.

Alternative B would result in a significant reduction of both acres and AUMs available to livestock grazing and would likely result in minor to moderate beneficial impacts to water resources in the planning area. Water resources in areas closed to grazing would likely improve from current conditions because structural range improvements and livestock use would be eliminated. Management that strives to attain reference state vegetation in riparian-wetland areas would benefit water resources in the northern portion of the planning area. Individual playas throughout the remainder of the Monument would benefit from the restricted season of livestock use.

Alternative C would result in a minor reduction of acres and AUMs available to livestock grazing. Alternative C is similar in many respects to Alternative A, but Alternative C includes additional management actions that increase protection of water resources. Overall, Alternative C would likely result in minor to moderate beneficial impacts to water resources in the planning area.

Alternative D would close the planning area to livestock grazing. This alternative provides the greatest protection to soils and vegetation from disturbances related to livestock grazing management, and therefore would likely result in moderate beneficial impacts to water resources in the planning area.

Alternative E would reduce allocated AUMs available to livestock grazing by approximately 50%, and would likely maintain or result in minor to moderate beneficial impacts to water resources in the planning area. Should AUMs be removed or reduced in areas supporting water resources then water resource conditions would be expected to improve in those areas because removal of unnecessary structural range improvements would decrease livestock use.

#### **4.2.2.2. Assumptions**

- Riparian areas will be managed to meet Standards and PFC under all alternatives.
- Attainment of PFC is the minimum needed for proper riparian function. This minimum is not the same as late-successional riparian communities.
- Riparian areas and stream channels exhibit natural variability and periods of instability due to erosional and depositional forces on the stream banks and stream bed.
- Actions that disturb soils, particularly those most susceptible to erosion, are more likely to create dust or deliver sediment to surface waters and adversely impact water resources.
- Actions that protect soils and vegetation will generally mitigate or prevent adverse impacts on water resources.
- The greater the amount of surface disturbance in a watershed, the greater the probability that excess surface runoff and sediment will enter the stream and contribute to the loss of riparian-wetland functionality.
- Surface runoff to streams generally increases as livestock stocking rates increase, but this is not a linear relationship. For example, low stocking rates typically result in no measurable impact to surface runoff, moderate stocking rates typically result in a negligible impact to surface runoff, and high stocking rates have the highest potential for increasing surface runoff to streams.
- Actions that reduce AUMs and restrict season of use could cause livestock use patterns to shift, thereby increasing or decreasing use both inside and outside of the Monument.
- Placing salt and mineral supplements outside riparian-wetland communities is a tool that can reduce livestock use of riparian-wetland areas.
- Salt and mineral supplements will not be located within 0.25 mile of water resources [USDI, 2006].
- Wildlife can adversely impact riparian-wetland areas, depending on the numbers and types of wildlife and when the use occurs. However, impacts from wildlife are more localized and site specific and are not widespread in the planning area.
- Consideration of surface water conditions when conducting BLM assessments, such as PFC and LHAs, will help to identify areas for management efforts.
- Water rights currently filed for livestock grazing management that will no longer be used for that purpose will be transferred to wildlife use and/or fire protection use.
- Water developments will continue to be available for fire suppression purposes.

#### **4.2.2.3. How Activities Affect Water Resources**

##### ***Water Resources Management Actions***

Improving riparian-wetland areas not currently in PFC, by managing for Standards, would have long-term beneficial impacts on water resources by decreasing erosion and sedimentation through improved riparian and wetland vegetation. Maintaining riparian and wetland areas in PFC would

ensure that desirable vegetation would occur in a diverse mixture, and exhibit appropriate vigor, growth, and reproduction relative to the site's landform, geology, and hydrology. The sites would be relatively stable even during typical flood flow, and would resist the establishment of noxious weeds and invasive plants over the short and long terms. Any improvement beyond PFC would be beneficial for the areas affected, with the scale of those impacts dependent upon how much of the riparian-wetland area was improved rather than maintained. Reference state condition would vary by area, but would likely contain deep-rooted hydric vegetation (e.g., *Carex*, *Juncus*, and/or *Salix* species) that would increase bank stability and maintain high water table levels. Management actions that improve watershed conditions in adjacent uplands and promote re-vegetation of riparian-wetland areas would reduce sediment input into surface waters and improve water quality over the short and long terms.

### ***Vegetation Resources Management Actions***

Activities that affect the ecological condition of the watershed and its vegetative cover would directly or indirectly affect water resources. The degree of impact attributed to any one disturbance or series of disturbances is influenced by location within the watershed, time and degree of disturbance, existing vegetation, and hydrologic condition. In general, adverse or beneficial changes to vegetation could have corresponding adverse or beneficial impacts on water resources. For example, upland activities that result in ground disturbance or changes to vegetative cover could result in short-term increases in sediment to local water resources, thereby degrading water quality.

Climate change could also affect vegetation composition and precipitation patterns, thereby altering the recharge to springs and seeps. Specifically, climate change could lead to warmer and drier summer conditions via shifts in the timing, duration, and amount of precipitation, effectively facilitating increased wildland fire severity and frequency. Low-to-moderate-intensity fires release nutrients into the water and hold long-term importance for land- and stream-form development. However, larger and more severe fires could result in the temporary loss of riparian vegetation and associated stream shading, thereby increasing water temperatures and accelerating sediment transport into stream systems [Ecoregional Assessment Program, 2013]. Reductions in vegetation cover, whether through climate change, fire, or livestock grazing, could increase the erosion potential of an area, whereas increases or shifts in vegetation cover to more resilient and stable species could reduce erosion potential.

Management systems that use grazing to modify vegetation in a prescriptive manner, such as prioritizing utilization on non-native perennial seedings, could have beneficial direct and indirect impacts on water resources over the long term by placing emphasis on grazing in areas of the Monument that do not have riparian-wetland resources. Limiting or eliminating livestock use of riparian vegetation, or altering the timing and duration of the riparian area grazing, would help promote healthy vegetation that directly benefits riparian areas and water resources by stabilizing streambanks and filtering sediment from overland flow before it enters water bodies [USDI, 2006].

### ***Wildlife and Fish Resource Management Actions***

Scheduling small-scale construction activities and routine maintenance to avoid or minimize disturbance to priority species and their habitat during important seasonal periods is not expected to adversely or beneficially impact water resources.

### ***Livestock Grazing Management Actions***

Livestock grazing can impact riparian vegetation and water resources in different ways, depending on the season of use, pasture rotation, stocking rate, and existing vegetation [USDI BLM, 1997b]; [USDI, 2006]. Management actions that improve watershed conditions in adjacent uplands (e.g., managing for Standards) could reduce sediment input into riparian and aquatic systems, and would benefit water resources over the short and long terms. Conversely, livestock congregation in riparian-wetland areas can adversely impact water quality by over-utilizing riparian forage, which removes shade materials, and can increase water temperature. Streambank disturbance from hoof shear, soil compaction, and vegetation disturbance and removal can also contribute to increased sedimentation and water temperature. Fecal deposition increases when livestock congregate near surface waters and adversely impacts water quality by increasing fecal coliform. Indirect livestock grazing impacts could result from the reduced ability of the system to withstand a high runoff event, leading to accelerated erosion or stream channel alteration.

Grazing during the summer and fall can increase riparian and water quality impacts because livestock tend to congregate where limited resources of water, shade, and forage can be found during high temperatures [Baker, Boren, & Allison, 2001]. Grazing earlier in the growing season (spring and early summer) allows riparian vegetation more time to recover than either late summer or fall grazing and can improve vegetation growth in riparian areas, if carefully monitored [Mosley, Cook, Griffis, & O’Laughlin, 1997]; [Baker et al., 2001]. Improved riparian vegetation would benefit water quality by increasing stream shade, lowering water temperature, and decreasing sedimentation. Winter grazing has the least overall impact on riparian areas [USDI BLM, 1997b]; [Baker et al., 2001]. However, long-term use of riparian areas in winter could lead to a decline of palatable native species, which could increase water temperatures from reduced vegetative cover.

In areas where livestock use is continuous or takes place annually during the critical growing season for uplands or during the riparian-wetland hot seasons, moderate or less use ( $\leq 60\%$  utilization) might be necessary to achieve Standards and PFC. Higher levels of livestock grazing could decrease bank stability, increase soil compaction, and lead to a loss of vegetative cover [USDI, 2006]. Concentrated livestock grazing in these areas would also result in greater potential to introduce noxious weeds and invasive plant species. However, slight to moderate livestock grazing would likely result in beneficial impacts to riparian-wetland systems by reducing potential for over use, hummocking, and streambank shearing. With healthier herbaceous communities, riparian-wetland areas would be capable of filtering and trapping more sediments and contaminants, which would enhance water quality.

Monitoring and adaptive management can be used as tools to reduce the impacts of livestock grazing on riparian-wetland areas and water quality [Williams, Szaro, & Shapiro, 2009]. Fencing streams to exclude livestock grazing is also a widely used approach for restoring riparian habitats [Platts, 1991] and improving water quality. Under all alternatives, management would seek to restore or protect the integrity and functionality of riparian-lentic (i.e., riparian or wetland) systems, benefitting water resources over the long term.

#### **4.2.2.4. Discussion of Impacts by Alternative**

##### **Water Resources: Alternative A**

##### ***Water Resources Management Actions***

Alternative A manages riparian-wetland areas for PFC, which would beneficially impact water resources over the long term. The BLM manages for Standards and implements various site-specific actions to move areas toward PFC. Management actions may include water developments in upland habitats to draw grazing animals away from riparian-wetland areas, exclusionary fences to eliminate use by livestock, and frequent herding of livestock away from riparian-wetland areas. These actions are anticipated to ultimately result in a riparian-wetland system with increased vegetation and structural diversity, which would provide better water quality and decreased sedimentation compared to nonfunctional areas. Systems that meet PFC would also be resilient to sedimentation resulting from upland disturbances.

Current management would not specifically protect playa resources from livestock grazing. However, under all alternatives, no additional playas would be modified or developed; playas that have been altered for livestock use would also be evaluated for potential restoration on a case-by-case basis.

If livestock use reached total allowable permitted levels, maintaining and/or improving riparian-wetland areas to PFC would likely require additional site-specific management to achieve DFCs as compared to the current situation. Several springs in the northern portion of the planning area are currently fenced off to livestock and would not be impacted by changes in livestock grazing management. However, additional fencing or managing for appropriate seasons and duration of use would need to be implemented to protect or restore the natural function of riparian-wetland areas not currently excluded from livestock.

#### ***Vegetation Resources Management Actions***

Alternative A manages vegetation communities to meet Standards. Sagebrush steppe that meets Standards promotes resilient herbaceous communities capable of stabilizing upland soils, dissipating water-flow energy, and increasing water infiltration rates and water-holding capacity. Healthy vegetation communities minimize sedimentation and excessive water flow into riparian-wetland areas, promoting PFC. Conversely, degraded sagebrush steppe allows for increased overland flow and sediment movement. Degraded vegetation communities also contribute to increased erosion and sedimentation in riparian-wetland areas until they are improved to meet Standards.

If livestock grazing use reached total allowable permitted levels, maintaining and/or improving sagebrush steppe communities to meet Standards would likely require additional structural range improvements (e.g., pipelines and water troughs) to achieve DFCs as compared to the current situation. Increased grazing use in the immediate vicinity of new developments could locally degrade vegetation communities, which could adversely impact water resources in those watersheds at both localized and landscape scales.

#### ***Wildlife and Fish Resource Management Actions***

Scheduling small-scale construction activities and routine maintenance to avoid or minimize disturbance to priority species and their habitat during important seasonal periods is not expected to adversely or beneficially impact water resources.

#### ***Livestock Grazing Management Actions***

Alternative A allows livestock grazing on 273,900 acres of BLM-administered lands in the planning area. It does not allow livestock grazing on 1,200 acres of the planning area. However,

the relative scarcity of surface water in the Monument means the effects of management actions would usually be localized to individual water bodies except in the northern portion of the planning area.

Riparian-wetlands would experience the highest adverse impacts during the summer when livestock tend to loiter and select these areas for higher-quality forage, open water, and thermal cover. If improperly managed, livestock could directly impact bank stability in lotic systems; limit the growth, vigor, and composition of riparian-wetland herbaceous communities; affect water quality; and create hummocking and compaction, which decreases water infiltration rates and water-holding capacity [USDI, 2006]. Overuse of upland forage could also cause increases in overland flow, contributing to excessive sedimentation in riparian-wetland areas. Grazing management strategies, such as rotation, deferment, seasonal rest, and the manipulation of season of use and grazing intensity, would be implemented to manage vegetation composition, cover, and vigor to maintain or achieve Standards and PFC. Fences could also be used to restore riparian-wetland areas that do not meet PFC by minimizing livestock grazing. However, fencing all riparian-wetland areas would not be a practical management strategy over a large scale, and fences could result in a number of adverse impacts to wildlife (see Section 4.2.4.3 Livestock Grazing Management Actions).

Most water bodies affected by livestock in the Monument would be ephemeral playa lakes. Many of the naturally formed playas have historically been modified to increase their storage capacity for livestock watering. These and other livestock improvements serve to distribute livestock over a larger area, but also can increase concentrated use. Livestock use during spring and early summer could contaminate individual playas with fecal coliform bacteria and nutrients from manure. Localized effects on water quality from grazing use would be expected to be long term with intensity ranging from negligible to potentially major in local sites, depending on the concentration level and duration of livestock use. The effects would occur in individual playas throughout the Monument but would likely be more pronounced in smaller water bodies, which have less capacity to dilute added nutrients.

## **Water Resources: Alternative B**

### ***Water Resources Management Actions***

Alternative B manages riparian-wetland areas to maintain or achieve PFC but also strives to attain reference state vegetation in riparian-wetland areas relative to site potential. Unlike Alternative A, which relies on managing for Standards and implementation of site-specific actions to maintain and/or achieve PFC, Alternative B focuses on using the natural capacity of sites and reduced levels of livestock grazing to improve riparian-wetland areas. Riparian fencing would likely need to be implemented to achieve reference state conditions if found to result in a net benefit to wildlife. Other potential management actions include developing water in upland habitats to draw grazing animals away from riparian-wetland areas and/or frequent herding of livestock away from riparian-wetland areas.

PFC is a minimal requirement for meeting Standards 2 and 3 (Appendix H, *Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management [USDI BLM, 1997]*) and provides for properly functioning riparian-lentic systems that are capable of dissipating stream energy associated with high waterflows, thereby reducing erosion and improving water quality. However, this minimum is not the same as late-successional riparian-wetland communities. Successfully managing toward reference state would provide for greater benefits to water



resources by further improving conditions, including functional status and water quality. The potential to attain these benefits is more likely under Alternative B relative to Alternative A.

### ***Vegetation Resources Management Actions***

Alternative B also manages vegetation communities to maintain or achieve Standards. However, this alternative prioritizes livestock use on non-native perennial seedings, which could beneficially impact springs and streams by placing emphasis on grazing in areas of the Monument that do not have riparian-wetland resources. Playas in the seeded areas could be impacted from increased livestock use, however. Effects to individual playas could include minor to moderate changes in nutrient concentrations, bacteria levels, and turbidity.

### ***Wildlife and Fish Resource Management Actions***

Impacts on water resources are expected to be the same as discussed for Alternative A.

### ***Livestock Grazing Management Actions***

Alternative B allows livestock grazing on approximately 254,100 acres of BLM-administered lands in the planning area. Approximately 21,000 acres of the planning area would be unavailable to livestock grazing. Areas unavailable to livestock grazing contain numerous playa lakes that would benefit from the closure over the short and long terms. Riparian-wetlands would primarily benefit from the reduction of livestock grazing; however, concentrated use near surface waters would continue to occur.

Several springs in the northern portion of the planning area are currently fenced off to livestock and would not be impacted by changes in livestock grazing management. Riparian-wetlands that are accessible to livestock across the northern portion of the Monument would benefit from lower levels of livestock use and associated riparian and upland area disturbances that alter the natural delivery of sediment, organic matter, and woody debris to surface waters. Locally, the reduction in numbers of livestock would result in less vegetation use, bank erosion, sedimentation, and/or contaminants from fecal matter, as compared to the current condition. The water quality of individual playas in the available areas also would improve due to the potential reduction in fecal deposition and subsequent contamination with fecal coliform bacteria and nutrients.

Water resources outside the Monument could receive more or less livestock use as a result of the AUM reductions in the planning area. For example, numerous springs and perennial streams are present in the BLM portions of grazing allotments that span the Monument boundary. Additional livestock use in these pastures would increase the potential for sedimentation, loss of streamside vegetation, and loss of water-holding capacity.

Restricting livestock grazing to avoid nesting and early brood-rearing habitats from March 15 to June 15 would likely result in increased use of these areas during the late summer, adversely impacting riparian-wetland resources in the northern portion of the Monument. Conversely, playas are primarily used by livestock during the spring and early summer and would generally benefit from the restricted season of use. Management actions designed to protect cultural resources from concentrated livestock use would also benefit playa resources by ensuring that water developments, supplements, and holding facilities are placed at least 200 meters from playa edges.

Alternative B focuses on the use of livestock grazing management strategies that do not require additional water developments to maintain, enhance, or achieve objectives. Water resources would not be impacted by the development of additional reservoirs, playas, wells, or springs

during the life of this MMP. For example, under current management, development of springs and other water sources to support livestock could alter the vegetation present at the water sources before diversion, resulting in a decrease in the extent of riparian-lentic areas.

Compared with Alternative A, management under Alternative B would further reduce, but would not eliminate, impacts from livestock grazing activities on water resources. Alternative B would provide long-term benefits to playa lakes in areas closed to livestock grazing. Individual playas throughout the remainder of the Monument would benefit from the restricted season of livestock use. Management that strives to attain reference state vegetation in riparian-wetland areas would benefit water resources in the northern portion of the planning area. However, springs and streams could be adversely impacted in the short-term by increased livestock use during late summer.

### **Water Resources: Alternative C**

#### ***Water Resources Management Actions***

Similar to Alternative A, Alternative C would beneficially impact water resources over the long term by managing for PFC. However, maintaining and/or improving streams and springs to PFC would likely require additional site-specific management to achieve DFCs as compared to the current situation.

#### ***Vegetation Resources Management Actions***

Impacts on water resources are expected to be similar to Alternative B. However, additional management actions under Alternative C would consider directing grazing for sagebrush recovery and/or to benefit the diversity of seedings, resulting in beneficial impacts to springs and streams, under the current condition, by placing emphasis on grazing in areas of the Monument that do not have riparian-wetland resources. However, playas near the seeded areas could be impacted from increased livestock use. Effects to playas could include minor to moderate changes in nutrient concentrations, bacteria levels, and turbidity.

Alternative C would allow for implementation of up to 1,000 acres of ungrazed reference plots throughout the planning area. Surface-disturbing activities associated with these efforts could have short-term impacts on water resources by increasing the delivery of sedimentation; however, water resources within the exclosed areas would likely incur long-term benefits from the removal of livestock.

#### ***Wildlife and Fish Resource Management Actions***

Impacts on water resources are expected to be the same as discussed for Alternative A.

#### ***Livestock Grazing Management Actions***

Under Alternative C, approximately the same number of acres and AUMs would be available to livestock grazing as under Alternative A. However, Alternative C adjusts livestock grazing season-of-use dates and terms and conditions on a case-by-case basis to avoid adverse effects to vegetation condition. Similar to Alternative A, in the short-term Alternative C could result in more livestock use near surface waters compared to the current condition, which would adversely impact those resources.

Alternative C promotes the use of livestock management strategies such as rotation, deferment, seasonal rest, and the manipulation of season of use and grazing intensity to maintain or achieve

Standards and PFC. Systems that prove to be ineffective will be reevaluated and revised as necessary. Similar to Alternative B, allowing for annual and within-year modification of livestock grazing systems would provide the opportunity to adapt to changing conditions, especially during drought periods.

Similar to Alternative B, Alternative C suggests scheduling livestock grazing to avoid nesting and early brood-rearing habitats from March 15 to June 15 in sage-grouse nesting and early brood-rearing habitats, which could result in increased use of these areas during the late summer, adversely impacting riparian-wetland resources in the northern portion of the Monument. Although similar to Alternative B, the probability that these impacts could occur may be less likely under alternative C because these practices are suggested where practical, but not required. In addition, Alternative C would likely result in the greatest use of riparian-wetland areas during late summer, relative to the other alternatives, due to higher permitted AUM levels and restrictions on livestock use during spring and early summer.

Similar to Alternative B, existing water developments would be evaluated during LHAs to determine if modifications are necessary to achieve objectives, which could benefit water resources. However, Alternative C would also allow for new water developments in the planning area. Potential for an increase in invasive species establishment would be monitored and treated post-construction. However, there would be surface disturbance where projects are constructed that could result in short-term increases in sediment to local water resources. New developments such as troughs and supplements could also distribute livestock to areas currently too remote from water to be grazed substantially, resulting in a reduction of water quality impacts to nearby playas.

Alternative C grazing management would likely result in greater long-term beneficial impacts to water resources than Alternative A. Management actions relative to livestock grazing would be similar to those described for Alternative B, but additional structural range improvements would be permitted that could benefit water resources. Compared to the current condition, increased livestock use in sensitive areas could result in adverse impacts to water resources. However, conducting LHAs, allowing for annual and within-year modification of livestock grazing systems, and designing and managing range improvements to conserve, enhance, or restore sage-grouse seasonal habitats would ensure movement towards meeting objectives for water resources, relative to Alternative A.

## **Water Resources: Alternative D**

### ***Water Resources Management Actions***

Similar to Alternative B, Alternative D strives to attain reference state vegetation in riparian-wetland areas. Objectives for water resources would likely be achieved faster through livestock removal than by managing with livestock because recovery could occur without mechanical disturbance and vegetation removal or alteration. However, for severely degraded or altered sites, active restoration may be required to achieve reference state condition [Gardner, Stevens, & Howe, 1999]. Where range improvements are determined to have a negative impact on riparian function, active restoration would be utilized to improve riparian function and restore springs to their pre-developed state, thereby benefitting water resources where these improvements are implemented.

### ***Vegetation Resources Management Actions***

Similar to Alternative A, Alternative D manages vegetation communities to meet Standards, which would promote the health of water resources over the long term.

### ***Wildlife and Fish Resource Management Actions***

Impacts on water resources are expected to be the same as discussed for Alternative A.

### ***Livestock Grazing Management Actions***

Under Alternative D, livestock use would be unavailable on approximately 275,100 acres for the life of the plan; no grazing would be authorized on the BLM-administered lands in the planning area. Structural range improvements and disturbance attributed to livestock use and livestock management would be prioritized for removal, rehabilitation, or restoration except where required to keep livestock out of the planning area. Similar to Alternative B, water resources in allotments outside the Monument boundary could receive more or less livestock use as a result of the AUM reductions in the planning area.

Several springs in the northern portion of the planning area are fenced off to livestock and would not be impacted by changes in livestock grazing management. Riparian-wetlands that are currently accessible to livestock across the northern portion of the Monument would benefit from decreased riparian and upland area disturbances that alter the natural delivery of sediment, organic matter, and woody debris to surface waters. Locally, the cessation of livestock grazing would result in less vegetation use, bank erosion, sedimentation, and/or contaminants from fecal matter, as compared to the current condition. In areas where streambanks or riparian-wetland vegetation is degraded, livestock exclusion may enable passive recovery to occur [USDI, 2006]. However, for severely degraded or altered sites, active restoration may be required to achieve reference state condition [Gardner et al., 1999]. In the remaining portions of the Monument, including Laidlaw Park, numerous playa lakes would benefit from the closure over the short and long term. Specifically, the water quality of individual playas would likely improve due to the reduction of fecal deposition and subsequent contamination of surface waters with fecal coliform bacteria and nutrients.

Although closing the Monument to livestock grazing would generally maintain or improve water resources within the planning area, the degree of impact would vary by season. For example, playas are primarily used by livestock during the spring and early summer and likely would not benefit from grazing closures occurring during late summer, fall, or winter because soils would be dry or frozen and there would be little to no water present in playas during this time. Conversely, riparian-wetlands would primarily benefit from grazing closures during late summer because livestock tend to congregate where limited resources of water, shade, and forage can be found during high temperatures; however, closures occurring during any season may promote recovery of the streambank and/or the functional riparian community [USDI, 2006].

Management under this alternative would include removal of water developments, fences, and other structural range improvements, which would result in short-term surface disturbances that could impair water resources. However, removing troughs near springs could make more water available on the ground, thus increasing the extent of riparian-lentic areas over the long term.

### **Water Resources: Alternative E**

#### ***Water Resources Management Actions***

Similar to Alternative A, Alternative E would beneficially impact water resources over the long-term by managing for PFC.

### ***Vegetation Resources Management Actions***

Similar to Alternative C additional management actions under Alternative E would consider directing grazing for sagebrush recovery and/or to benefit the diversity of seedings, resulting in beneficial impacts to springs and streams by placing emphasis on grazing in areas of the Monument that do not have riparian-wetland resources. However, playas near the seeded areas could be impacted from increased livestock use. Under such circumstances, effects to playas could include minor to moderate changes in nutrient concentrations, bacteria levels, and turbidity. Similar to Alternative C, Alternative E would allow for implementation of up to 1,000 acres of ungrazed reference plots throughout the planning area. Surface-disturbing activities associated with these efforts could have short-term impacts on water resources by increasing the delivery of sedimentation; however, water resources within the exclosed areas would likely incur long-term benefits from the removal of livestock.

### ***Wildlife and Fish Resource Management Actions***

Impacts on water resources are expected to be the same as discussed for Alternative B.

### ***Livestock Grazing Management Actions***

Alternative E would reduce allocated AUMs in the Monument to 19,338. Impacts on water resources from livestock grazing management actions are expected to be greater for Alternative E relative to Alternative B, but would be less than Alternatives A and C. Alternative E prescribes 48% more AUMs than Alternative B. Conversely, Alternative E reduces AUMs by approximately 50% and 51 % relative to Alternatives A and C, respectively. Similar to other Alternatives, Alternative E is expected to have beneficial long-term impacts to water resources by managing for meeting PFC. Alternative E allows livestock grazing on approximately 272,800 acres of BLM-administered lands in the planning area. Additional acres of the planning area, including areas that support water resources, could be unavailable to livestock grazing if portions of the Monument are closed to accommodate a reduction in AUMs from the current condition.

It is expected that riparian-wetlands would primarily benefit from the reduction of livestock grazing; however, concentrated use near surface waters would continue to occur. In areas where livestock use is continuous or takes place annually during the critical growing season for uplands or during the riparian-wetland hot seasons, moderate or less use ( $\leq 60\%$  utilization) might be necessary to achieve Standards and PFC. Higher levels of livestock grazing could decrease bank stability, increase soil compaction, and lead to a loss of vegetative cover [USDI, 2006]. Concentrated livestock grazing in these areas would also result in greater potential to introduce noxious weeds and invasive plant species. However, slight to moderate livestock grazing would likely result in beneficial impacts to riparian-wetland systems by reducing potential for over use, hummocking, and streambank shearing. With healthier herbaceous communities, riparian-wetland areas would be capable of filtering and trapping more sediments and contaminants, which would enhance water quality. Several springs in the northern portion of the planning area are currently fenced off to livestock and would not be impacted by changes in livestock grazing management. Riparian-wetlands that are accessible to livestock across the northern portion of the Monument would benefit from lower levels of livestock use and associated riparian and upland area disturbances that alter the natural delivery of sediment, organic matter, and woody debris to surface waters. Locally, the reduction in AUMs would result in less vegetation use, bank erosion,

sedimentation, and/or contaminants from fecal matter, as compared to Alternatives A and C. The water quality of individual playas in the available areas also would improve due to the potential reduction in fecal deposition and subsequent contamination with fecal coliform bacteria and nutrients. Water resources outside the Monument could receive more or less livestock use as a result of management actions that restrict livestock grazing in the planning area. For example, springs and perennial streams are present in the BLM portions of grazing allotments that span the Monument boundary. Additional livestock use in these pastures could increase the potential for sedimentation, loss of streamside vegetation, and loss of water-holding capacity. Conversely, a reduction of livestock use in these pastures could reduce that potential.

Similar to C, Alternative E suggests scheduling livestock grazing to avoid nesting and early brood-rearing habitats from March 15 to June 15 in sage-grouse nesting and early brood-rearing habitats, which could result in increased use of these areas during the late summer. Avoiding spring and early summer grazing in nesting and late brood-rearing sage-grouse habitats would likely result in increased use of these areas during the late summer, adversely impacting riparian-wetland resources in the northern portion of the Monument. Conversely, playas are primarily used by livestock during the spring and early summer and would generally benefit from the restricted season of use. Management actions designed to protect cultural resources from concentrated livestock use would also benefit playa resources by ensuring that water developments, supplements, and holding facilities are placed at least 200 meters from playa edges.

Alternative E focuses on the use of livestock grazing management strategies that result in no net gain in disturbance from livestock related infrastructure or development. Minimizing the footprint of livestock related infrastructure and developments would not result in additional impacts to water resources from the development of new infrastructure. Requiring a no net gain in disturbance from livestock related infrastructure is expected to maintain, but not increase, current levels of disturbance associated with these features. Alternative E would provide long-term benefits to playa lakes in areas closed to livestock grazing. Individual playas throughout the remainder of the Monument would benefit from the restricted season of livestock use. Managing for PFC would benefit water resources throughout the planning area.

### **4.2.3. Vegetation Resources**

#### **4.2.3.1. Summary**

Alternative A would allow livestock grazing to continue in the same manner as currently authorized. This alternative allocates the greatest number of acres to livestock use with the fewest restrictions on that use. Vegetation DFCs would continue to be met through restoration objectives and treatments identified in the 2007 MMP, through the use of the fuels program for proactive vegetation treatments, and to a lesser extent, Emergency Stabilization and Burned Area Rehabilitation (ES & BAR) projects for stabilization following wildfires. Livestock management and its impacts on the vegetation resources would continue to be deferred to the implementation-level management following Land Health Assessments. Impacts upon vegetation resources would be minor to moderate under Alternative A. As new range improvement projects are allowed, those areas would be localized, but detectable. Areas of vegetation treatments would experience widespread, detectable changes in the vegetation resources.

Alternative B reduces AUMs by varying degrees across the Monument. Reductions, areas made unavailable to livestock grazing, and management actions would be used to meet the DFCs.

Alternative B makes the least acreage available to livestock grazing while still allowing the use to occur. Monument values in kipukas and previously identified unique vegetation communities would be protected through the removal of livestock grazing, and authorized use levels would be greatly reduced across the entire Monument. Other uses identified in the 2007 MMP would continue to be allowed across the Monument. Alternative B would allow minor, localized enhancement through removal of range improvement projects and moderate impacts to vegetation resources from vegetation treatments.

Alternative C allocates roughly the same AUMs as are currently permitted, and also designates management actions to use livestock grazing at the permitted level as a tool to achieve DFCs. Alternative C authorizes the most livestock use and meets the 2007 MMP DFCs through the proactive application of livestock grazing. Alternative C would also allow minor to moderate impacts to vegetation resources, for similar reasons as Alternative A.

Alternative D makes the entire Monument unavailable to livestock grazing. Most DFCs are met through other actions identified in the 2007 MMP. Alternative D would have minor effects, due to the boundary fence, and moderate effects due to the vegetation treatments.

Alternative E reduces allocated AUMs to the high recent actual use level; about half of those allocated in alternatives A and C. No net gain in disturbance from livestock related infrastructure would be allowed. All new infrastructure would be established in existing disturbance areas or be mitigated by rehabilitating disturbance elsewhere. All other management actions are similar to those in Alternatives A and C. The impacts of Alternative E would be minor to moderate.

Each alternative offers the opportunity to manage for maintaining conditions that meet PFC or for improving existing vegetation conditions, as described by the DFCs. Livestock grazing is addressed as a tool for directing the existing vegetation condition in Alternatives B and C. Alternative D completely removes livestock grazing, which would allow for the continued existing vegetation condition, except in areas where vegetation manipulation treatments are implemented, such as the poor condition sites identified for restoration in the 2007 MMP through the use of fuels treatments (e.g., prescribed fire, herbicide, and seedings).

Impacts to special status plant species within the area would be negligible. Because all alternatives would maintain current or reduce grazing levels, there would be no change in the current effects. Picabo milkvetch is endemic, but not at risk due to its preference for early to mid-seral sagebrush communities with stable, sandy soils [Moseley & Popovich, 1995]. Newly opened areas with fairly infrequent soil disturbance are favorable. Current and proposed management is not expected to change Picabo milkvetch habitat conditions.

Impacts to obscure phacelia would also be negligible throughout all alternatives due to its adaptation to low-level disturbance and need for an occasionally opened woody overstory in early to mid-seral communities. Big game browsing may be important for decreasing woody species canopy cover, while livestock may reduce perennial grass cover in obscure phacelia habitat (Murphy, 1995). Current and proposed management is not expected to change obscure phacelia habitat conditions.

#### **4.2.3.2. Assumptions**

The analysis area for vegetation resources is all BLM lands within the planning area. This analysis describes potential impacts to vegetation from management actions and resource uses that are the

focus of the MMP Amendment. Livestock grazing, the management activity addressed in the MMP Amendment has the potential to impact vegetation resources.

- Grasslands/Shrublands evolved with large ungulate grazing, but with different distribution, both spatial and temporal, utilization type, and intensity than typified by present day domestic livestock use.
- Fires will continue to happen. In the past 20 years, across the Great Basin, fire size and intensity have increased, and fire return interval has decreased. This trend is expected to continue.
- Achieving Standards is a priority and will continue to be. This includes maintenance of seeded areas to meet LHA stability objectives, at the least, and continue to maintain/improve native communities. Areas with intact shrub cover are considered desirable for both habitat and vegetation management objectives, which encourage maintenance and enhancement of those areas.
- Wildlife utilize vegetation for forage consumption and cover values. Large ungulates are present throughout the entire Monument and utilize a variety of plant species as forage and cover. The quality and distribution of the various vegetation types will continue to be a key component to wildlife presence and dissemination.
- Livestock grazing has been an ongoing use since the 1860s across a large portion of the Monument.
- Livestock grazing is one of the most common uses on the vegetation resources in the Monument. Restrictions and closures would successfully keep livestock out of restricted or closed areas.
- Noxious weed infestations will continue to be inventoried and treated. Noxious weeds will continue to be introduced across the planning area via land uses and natural processes, such as wind and wildlife movement. Management actions are assessed for potential to decrease or increase acres occupied by noxious weeds and invasive plant species.
- Plant responses to grazing vary by plant community, duration, timing, and intensity. Plants, both on the community and individual level, respond to grazing pressures in different ways. Timing and duration, as well as the current state or vigor exhibited by the plant, are all factors in how plants respond to pressures from biomass removal, stressor, or disturbance.
- Cultivars of native species would be considered native. Communities dominated by native cultivars would be classified as Native Perennial or Shrub/Native Perennial in the current vegetation map. In general, these communities would be expected to emulate native communities with respect to structure and ecosystem processes. Natural processes would continue to drive plant communities between ecological state and transitions.
- Current vegetation, as mapped, is used for the MMP Amendment. This dataset is dynamic and there may be small discrepancies in acreages and percentages. These are minor when applied in context across the entire planning area.

#### **4.2.3.3. How Activities Affect Vegetation Resources**

Livestock grazing can be a surface-disturbing activity, ranging from negligible to moderate disturbance impacts from uses and infrastructure associated with the activity. Impacts of this



activity to vegetation resources include crushing and consuming plants. Repetition of livestock grazing can lead to reduction of plant vigor and health, or entire removal of plants in a localized area. When this happens, areas become more at risk for the establishment of noxious weeds and invasive plant species, both as expansion from existing populations and establishment of new populations.

### ***Water Resources Management Actions***

Vegetation is a critical component in the functionality of a riparian system. It acts to disperse overland flows, trap sediment, stabilize and protect banks, and provide diverse species for wildlife cover and forage needs [USDI BLM, 2006]. Multiple studies have been completed regarding riparian area vegetation responses to livestock grazing. Treatment factors vary as much as responses, but timing, duration, and intensity are the three common factors of change implemented to derive a response in plant species diversity and system stabilization [USDI BLM, 2006]. Adjusting livestock grazing at the implementation level to meet PFC would meet the DFCs of riparian areas as outlined in the 2007 MMP.

### ***Vegetation Resources Management Actions***

Vegetation management action success depends on ecological site potential, current vegetation condition, presence of noxious weeds and invasive plant species, precipitation, and site factors such as aspect, slope, and elevation. Use restrictions would eliminate or reduce impacts from livestock grazing. Natural disturbance, such as wildfire, is anticipated to continue, as well as related short-term disturbances from ES & BAR activities; ES & BAR would also stabilize conditions and rehabilitate burned areas to perennial-dominated native vegetation types. Pro-active vegetation treatments have been discussed and identified in the 2007 MMP, and ES & BAR activities will follow the most recent Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) for the Twin Falls District.

Vegetation and soils have a close relationship; impacts to the soil resource can directly impact the health and functionality of vegetation. Impacts from water and wind erosion and other forms of surface disturbance can reduce the soil's capability to provide an environment that supports vegetation. A healthy soil resource will promote healthy vegetative attributes.

Climate change could lead to more drastic, episodic events that affect growth, phenology, and resilience of plants and populations. Drought tolerant species may thrive. Increase potential for die-off in marginal zones, such as small inclusions, increase invasive species that are better suited to a particular area than native species, resulting in a potential for species composition shifts in plant communities [Monahan & Fisichelli, 2014].

In the face of changing climate dynamics, diversity of species composition and inclusion of certain species in ecosystems may increase in importance. For instance, nitrogen-fixing legumes could become more important as a long-lived species to ecosystems because of their ability to increase C-sequestration for longer time periods [Derner & Schuman, 2007].

Uses and disturbance can lead to soil loss and site degradation, and reduced desirable species composition; or can contribute to increases in plant health, vigor, and changes in species composition that would help to attain DFCs.

### ***Livestock Grazing Management Actions***

Livestock grazing is the dominant use of the vegetation resource in the planning area. Historic grazing has been a major influence in plant succession. Appropriate grazing management can help improve plant vigor and species composition, while inappropriately managed grazing can lead to a decline in the health of a plant community, or facilitate a shift in composition [Curtin, 2002]; [Valone, Meyer, Brown, & Chew, 2002]; [Briske, Fuhlendorf, & Smeins, 2005]. It can also facilitate the introduction or expansion of noxious weeds or invasive plants, or provide a method of managing existing occurrences. Increasing and maintaining plant species richness can help improve community resistance to invasive plant expansion [Anderson & Inouye, 2001].

Control of weed populations through livestock grazing involves grazing an invasive species at a crucial point in its life-cycle. For example, cattle can graze areas infested with the annual grass cheatgrass in early spring before boot formation, thereby limiting seed production [Hempey-Mayer & Pyke, 2008]. However, the use of livestock for this purpose is expensive and requires a long-term commitment. Expenses and factors for success in grazing invasives are timing, duration of grazing, expense to the allotment holder in moving animals and intensive management provided by the BLM. It also has the potential to impact vegetative resources by reducing ground cover, increasing soil compaction, and making the area vulnerable to new noxious weeds or invasive plant species infestation.

Long-term, improper utilization can drive a plant community towards grazing tolerant species, such as rhizomatous grasses (e.g. Western wheatgrass) or mat-forming species (e.g. Sandberg bluegrass). This shift can progress further towards a large reduction in perennial species and increases in invasive annual grasses (e.g. cheatgrass). Combined with other disturbance factors, such as wildfire, a new successional state may appear. This creates a system that requires increased active inputs to regain a stable, resilient plant community.

Season of use is a contributor to the distribution and general utilization of vegetation by livestock. Season of use and stocking intensity together may have the biggest impact on sagebrush communities, as it relates to sage-grouse habitat [Beck & Mitchell, 2000]. Dates are generalized because climatic conditions vary from season to season, and are affected by plant phenology, soil moisture conditions, and general availability of use areas by varying degrees from year to year. For instance, annual grass phenology can vary tremendously from year to year, dependent on a variety of climatic conditions. If cheatgrass control or minimization in the vegetation community is the desired outcome, then grazing systems would need to vary use dates from year to year, as well. Fall green-up is a common phenomenon in the Monument area, so cheatgrass reduction by livestock would not be limited to spring grazing [Cox, R. D., & Anderson, V. 2004]. It is also recommended that a targeted cheatgrass reduction-grazing program be coupled with restoration/rehabilitation of desirable perennial species, in order to achieve a management objective of stabilized rangelands, moving towards a resilient plant community.

Special status plants can be impacted by livestock grazing or infrastructure in a similar manner as other more prevalent plant species. Livestock grazing infrastructure can impact plants by deep excavation and major soil compaction in localized areas and by creating an opportunity for noxious weeds and invasive plant species to establish or increase. Noxious weeds and invasive plant species can impair habitat for rare plants. Increases to the amount of infrastructure or concentrating livestock use in the plant's habitat could impact an occurrence.

#### **4.2.3.4. Discussion of Impacts by Alternative**

##### **Vegetation: Alternative A**

***Water Resources Management Actions***

Vegetation is a critical component in the functionality of a riparian system. It acts to disperse overland flows, trap sediment, stabilize and protect banks, and provide diverse species for wildlife cover and forage needs [USDI BLM, 2006]. Multiple studies have been completed regarding riparian area vegetation responses to livestock grazing. Treatment factors vary as much as responses, but timing, duration, and intensity are the three common factors of change implemented to derive a response in plant species diversity and system stabilization [USDI BLM, 2006]. Adjusting livestock grazing at the implementation level to meet PFC would meet the DFCs of riparian areas as outlined in the 2007 MMP.

There would be no changes to water management actions in Alternative A.

***Vegetation Resources Management Actions***

Currently, actual use has averaged 11,791 AUMs over the last 15 years, which is less than the 38,187 AUMs authorized in the 2007 MMP. In Alternative A, permitted use would remain the authorized use. Current average actual use would probably continue, and would impact vegetation in the same manner as the existing use. Current vegetation condition would also continue, as it relates to livestock grazing. However, actual use could increase to the permitted use level under this alternative.

Under Alternative A, grazing systems and timing would continue to be managed at the implementation level, during the permit renewal process. Spring, summer, fall, and winter grazing would continue at varying times across the Monument.

Forage utilization is expected to continue similar to current use levels. However, the full permitted use is nearly three times the 15-year average Actual Use under Alternative A. More vegetation would be removed during use and could impact plant community composition in either a positive or negative direction. However, the full permitted use would not be dispersed equally across the Monument, as roughly 1/3 of the allotments show average billed use at more than 90% of their permitted AUMs. In turn, the effects of increased vegetation consumption to the currently permitted use levels would be unequally distributed across the Monument.

LHAs would continue to be used to determine if current livestock management is compatible with Land Health Standards. Full permitted use would be an increase from the average actual use. Over the past 15 years, actual use has reflected roughly 1/3 of permitted AUMs are being utilized across the Monument. Use would continue to be directed at the permit renewal level, and would need to continue to meet DFCs described in the 2007 MMP. If 100% of permitted use was to occur, little change to vegetation removal and eventual composition shifts is anticipated in areas that are currently near 100% of the permitted use, while use levels would likely shift from slight to light and from light to moderate levels, averaging about 34% use, [USDI BLM, 1999] in areas where actual use is currently at a much reduced level from the permitted use.

The 2007 MMP describes limitations to infrastructure expansion for the Bowl Crater Allotment and the North Pasture of the Laidlaw Park Allotment. In Alternative A, these recommended limitations would continue.

***Wildlife and Fish Resources Management Actions***

Typically, timing of range improvements maintenance or construction for the benefit of wildlife coincides with the least sensitive time for plant communities (wildlife habitat). Avoidance

of construction and maintenance when soils are saturated and prone to compaction, or when noxious weeds have set fruit and would be likely to establish if dispersed by equipment used for maintenance would help protect or retain wildlife habitat conditions.

### ***Livestock Grazing Management Actions***

Currently, half (11) of the 22 allotments partially or entirely in the Monument are available for grazing in spring, fall and/or winter. One-quarter (5) of the allotments are available for grazing in the spring and fall. One-quarter (5) of the allotments are available for grazing in the summer and fall. One of the allotments is available for grazing in the spring only. The season of use is unlikely to change until permit renewals are completed for the individual allotments, or LHAs show that a change in season is necessary to meet Standards. Season of use is dependent on a range of variables, including availability of moisture and temperature to initiate current year's growth and development, and plant phenology throughout the year, and may include spring, summer, fall, or winter.

Currently, less than 1,200 BLM acres are unavailable for grazing. Areas currently excluded from grazing are not part of any allotments, are not readily accessible, and have not been assessed for ecological condition. Vegetation classification is available for these areas (Table 4.2, "BLM Acres of Vegetation Available to Livestock, by Alternative". The classifications are described in Chapter 3, and are described by acres unavailable in Table 4.1, "BLM Acres of Vegetation Unavailable to Livestock, by Alternative".

**Table 4.1. BLM Acres of Vegetation Unavailable to Livestock, by Alternative**

<b>BLM Midscale Vegetation Classification</b>	<b>Alternative A acres</b>	<b>Alternative B acres</b>	<b>Alternative C acres</b>	<b>Alternative D acres</b>	<b>Alternative E acres</b>
Roads, Urban	50	110	55	660	9
Unconsolidated Materials, Volcanic Rock, Bedrock, Scree, Cliff and Canyon	20	65	20	1,140	20
Northern Montane & Foothill Forest	7	7	7	10	7
Juniper & Mountain Mahogany Woodlands and Scrub	4	5	4	20	4
Riparian Shrubland	5	10	10	20	10
Subalpine & High Montane Forest	0	0	0	60	0
Northern Great Plains Woodland	0	0	0	30	0
Great Plains Mixedgrass Prairie & Shrubland	6	190	20	9,500	20
Tall Sagebrush Shrubland	700	15,100	1,000	96,200	1,750
Dwarf Sagebrush Shrubland	50	50	50	1,000	46
Dry Non-Native Perennial Grassland	100	600	100	104,900	108

<b>BLM Midscale Vegetation Classification</b>	<b>Alternative A acres</b>	<b>Alternative B acres</b>	<b>Alternative C acres</b>	<b>Alternative D acres</b>	<b>Alternative E acres</b>
Dry Non-Native Annual Grassland	150	1,000	150	28,200	160
Dry Non-Sagebrush Shrubland & Grassland	0	3,800	0	33,200	0

**Table 4.2. BLM Acres of Vegetation Available to Livestock, by Alternative**

<b>BLM Midscale Vegetation Classification</b>	<b>Alternative A Acres</b>	<b>Alternative B Acres</b>	<b>Alternative C Acres</b>	<b>Alternative D Acres</b>	<b>Alternative E Acres</b>
Roads, Urban	600	550	600	0	600
Unconsolidated Materials, Volcanic Rock, Bedrock, Scree, Cliff and Canyon	1,100	1,100	1,100	0	1,100
Northern Montane & Foothill Forest	5	5	5	0	5
Juniper & Mountain Mahogany Woodlands and Scrub	20	20	20	0	20
Riparian Shrubland	15	10	10	0	10
Subalpine & High Montane Forest	60	60	60	0	60
Northern Great Plains Woodland	30	30	30	0	30
Great Plains Mixedgrass Prairie & Shrubland	9,500	9,300	9,500	0	9,500
Tall Sagebrush Shrubland	95,500	81,200	95,200	0	94,500
Dwarf Sagebrush Shrubland	1,000	1,000	1,000	0	1,000
Dry Non-Native Perennial Grassland	104,800	104,300	104,800	0	104,800
Dry Non-Native Annual Grassland	28,000	27,200	28,000	0	28,000
Dry Non-Sagebrush Shrubland & Grassland	33,200	29,400	33,200	0	33,200

Areas currently identified as unavailable would remain so. These areas are not identified for vegetation treatments, and are unlikely to change vegetation composition to a measurable extent over the life of the plan, unless affected by natural disturbances, such as wildfire. Little change in vegetation classification is expected to occur in areas identified as Unconsolidated Materials, Volcanic Rock, Bedrock, Scree, Cliff and Canyon, Agriculture, Roads, and Urban areas.

Northern Montane & Foothill Forest, Juniper & Mountain Mahogany Woodlands and Scrub, Riparian Shrublands, and Great Plains Mixedgrass Prairie & Shrubland comprise 23 acres of the total unavailable to livestock grazing in Alternative A. Typically, these areas are in good condition, and are present in more favorable precipitation and elevation gradients that promote native plant diversity and resilience.

Tall Sagebrush Shrubland and Dwarf Sagebrush Shrubland are the main vegetation types unavailable in Alternative A, with a total of 784 acres. These areas may have variable composition in the understory, but sagebrush is the dominant overstory. Livestock grazing removal could affect these areas either positively or negatively over the life of the plan, dependent on current condition, past land use history, and climatic conditions. These changes include manipulation of the vegetation composition through livestock grazing; this shift could trend in a positive or negative direction. Residual vegetation cover could increase with reduced livestock grazing, which could benefit wildlife, help maintain soil moisture and reduce erosion; however in areas of high annual grass cover, this reduction in grazing use could contribute to increased fine fuels. Changes may not be significantly measurable, unless precipitated by a perceptible event. For instance, a community may persist in a consistent state until an episodic climate event occurs that influences the expansion of a certain plant component [Valone, Meyer, Brown, & Chew, 2002].

Dry Non-Native Perennial Grassland (108 acres) would require inputs to affect change to the current vegetation state to a more native vegetation type. Assisted succession is the most effective path for restoration from non-native perennial-dominated vegetation to a native community; in order to maximize treatment success, though, this requires inputs such as tilling and herbicides for undesirable plant species control, mechanical seedbed preparation, and seed placement through broadcast or drill [Cox & Anderson, 2004]. However, these areas are not identified as priorities for restoration in this alternative. It is unlikely that a measurable alteration in the vegetation community would occur over the life of the plan. Dry Non-Native Annual Grassland comprises 147 of the unavailable acres in Alternative A.

ES & BAR would still happen on all vegetation types, if determined necessary, through ES & BAR plans. Fire and proactive vegetation treatments to manage fuels, fire behavior, and vegetation response to fires will continue to occur at similar rates as seen over the last 33 years. While wildfire ignitions are unpredictable, and are either human-caused or natural, flame lengths, rates of spread and final fire size vary based on both natural and anthropogenic factors, such as fine fuel presence (especially non-native annuals), weather, topography, and response time. Livestock grazing would continue to remove fine fuels from the system, but effectiveness as a fire hazard reduction tool would be dependent on a variety of factors, including timing, duration, and intensity [Nader, Henkin, Smith, Ingram, & Narvaez, 2007].

In Alternative A, infrastructure related to livestock grazing would continue as directed under the 2007 MMP. Management of livestock grazing and its use on vegetation in the Monument would continue to be tied to achieving Standards on an allotment-by-allotment basis. Standards include guidelines for maintaining or improving conditions related to noxious and invasive weed species, native plant communities, rangeland seedings, and non-native annual communities. New range improvements would not be allowed in the Bowl Crater Allotment or the North Pasture of the Laidlaw Park Allotment unless they would result in a benefit to resources identified as needing improvement or protection. Range improvements could be considered for other resource needs, such as livestock management and dispersal in the rest of the Monument. Vegetation impacts from infrastructure varies from minimal ground disturbance for a short term such as is typical along a fence, to removal of vegetation directly around a water source, and a shift in vegetation condition and composition related to the changed dispersal of livestock following the implementation of a new range improvements. Range improvements could also be removed and restored to achieve the 2007 MMP DFCs, as well as to continue to achieve Standards. Actions would happen at the implementation level, such as through a grazing permit renewal.

In Alternative A, livestock grazing would be managed at the implementation level through permit renewals and changes would occur if Standards are not being met and grazing is a causal factor or necessary to improve conditions, then livestock grazing management would be changed. If a riparian area is not meeting PFC and livestock is determined to be a factor, then grazing management would be adjusted to meet PFC.

Fence and associated infrastructure removal would directly impact vegetation in the short term by crushing vegetation, and removing vegetation, such as shrubs, that interfere with fence removal. Long-term impacts are expected to be minimal, since ground disturbance is typically isolated to a localized area with fence removal. Cattleguards would also be removed. Cattleguards are typically associated with heavier traffic roads with reduced vegetation components, so removal would minimally impact the existing vegetation surrounding the cattleguard. However, treatment such as seeding or herbicide would help establish perennial vegetation and reduce noxious weeds and invasive plant species occurrences once the cattleguard has been removed.

An allotment could be retired from permitted grazing, but would still be available for “reserve” if the need for forage presented itself, such as if wildfire displaced livestock grazing from another area. Grazing would intermittently affect vegetation present, but would likely occur at a much reduced level, and would be available at varying seasons and durations. Vegetation response would depend on natural factors, and also with the type and level of use authorized as part of the reserve.

## **Vegetation: Alternative B**

### ***Water Resources Management Actions***

Vegetation components are a critical factor in the health, resilience, and condition of a riparian area. Improper timing and duration of livestock grazing can contribute to the removal of desirable vegetation in a riparian area, which can contribute to a decline in the functioning of the system.

This alternative would allow the suspension or modification of livestock grazing to occur if livestock grazing is determined to be a factor in not meeting riparian or watershed Standards, following LHAs. Vegetation is a critical component in the functionality of a riparian system. It acts to disperse overland flows, trap sediment, stabilize and protect banks, and provide diverse species for wildlife cover and forage needs [USDI BLM, 2006]. Multiple studies have been completed regarding riparian area vegetation responses to livestock grazing. Treatment factors vary as much as responses, but timing, duration, and intensity are the three common factors of change implemented to derive a response in plant species diversity and system stabilization [USDI BLM, 2006]. Adjusting livestock grazing at the implementation level to meet PFC would meet the DFCs of riparian areas as outlined in the 2007 MMP and Idaho and Southwestern Montana Sub-Regional Greater Sage-Grouse RMP Amendment. The continued movement of the riparian plant community toward a reference community state would provide a point of comparison for similar vegetation of other various riparian zone types.

Springs would not be developed. Four undeveloped springs are on the BLM portions of the Monument, and two developed spring systems. The developed springs are enclosed by fencing, which deters grazing and protects the associated vegetation from livestock use. It is anticipated that this condition would remain the same with Alternative B.

Water development practices have changed over the last few decades in ways that can enhance riparian vegetation. This includes trough placement, fencing, returning or cycling overflow

water through the riparian area, and improved spring box designs. Improvements to current water systems, and moving troughs out of riparian areas would improve the vegetation condition at those sites by reducing trampling and improving the efficiency of natural water use as a stock water source.

### ***Vegetation Resources Management Actions***

Livestock grazing would be directed towards Dry Non-Native Perennial Grass vegetation types (past seeding treatments) in order to reduce grazing pressures on native plant communities. In grass-dominated plant communities, sagebrush is a lacking component. Management changes to livestock grazing, including timing, intensity, and duration, can help facilitate achievement of DFCs. Impacts could be negligible at the landscape level to moderate at a localized area. For instance, fall grazing can maintain the existing community, and improve bunchgrass production, although improvement in forb production is variable. Heavy fall grazing by sheep may reduce sagebrush, but would likely only occur at localized areas, such as bedgrounds [Laycock, 1967]; [Laycock, 1979]. Heavy grazing can also lead to mortality of juvenile sagebrush through trampling, so grazing with the objective of reducing herbaceous cover competition in order to facilitate shrub establishment and expansion must be balanced with the effects of heavy grazing, which can include soil compaction, and increases in noxious weeds and invasive plant species.

Vegetation changes can be directed through a variety of management actions, including modifying timing of use, stocking rate, scheduling rest or deferment, livestock numbers, kind, and distribution. Grazing can be used as a tool to alter the vegetation community if a desirable seed source is present, whether in the soil as part of the seedbank or applied following reduction of vegetation by livestock grazing [Cox & Anderson, 2004]; [Davies, Boyd, & Nafus, 2013]. The impacts to values such as soil stability and the potential for noxious weeds and invasive plant species to increase must be considered. Grazing has the potential to increase soil compaction, and the feasibility to implement the necessary level of grazing intensity and duration on a landscape scale can be limiting factors in utilizing grazing as a restoration/rehabilitation tool. Grazing can be used as one component of a multifaceted restoration program. Active restoration would be necessary to facilitate native species recovery in areas with abundant sagebrush overstory and a high percentage of invasive annuals comprising the understory, such as is found in Larkspur Park.

Natural recovery allows natural processes to occur and regenerate vegetation in areas subjected to a disturbance. Variables such as degree of disturbance (e.g. massive soil removal or disturbance), and previous condition of the area, drought, pests, disease, noxious weeds and invasive plant species presence, determines the time required to see a measurable amount of recovery at a site.

### ***Wildlife and Fish Resources Management Actions***

Impacts from wildlife management actions would be the same as discussed in Alternative A.

### ***Livestock Grazing Management Actions***

In Alternative B, new livestock developments would not be allowed in areas closed to grazing (approximately 21,000 acres). This would eliminate the impacts to vegetation associated with developments, such as vegetation removal and trampling, soil disturbance and compaction, and vegetation composition shifts. Use-concentration areas are associated with livestock developments, and typically cause a removal of vegetation or change in composition. Noxious weeds and invasive plants have an increased potential to establish or spread when soil and vegetation are disturbed, and are associated with livestock developments. Removal, consolidation,



or modification with the intention of benefitting wildlife would also provide a net overall benefit for the vegetation present.

Under Alternatives B, C, D and E, the Kimama Allotment would gain 40 acres of non-Monument lands. Poison Lake Allotment would gain nearly 800 acres of Monument lands. 80% is Dry Non-Native Perennial Grassland, and nearly 20% is Dry Non-Native Annual Grassland. Shifts to the allotment boundaries are likely to incur the same impacts to vegetation through utilization by livestock.

Livestock grazing is an action that is associated with removal of vegetation, trampling, and some soil disturbance, especially when it occurs in conjunction with concentrated-use areas. Alternative B would avoid placement of concentration areas near sensitive cultural resources, which would help protect these resources by dispersing use on vegetation and soils in the area, thus retaining vegetation cover and soil intactness in those localized areas. This would help protect the sensitive soil and vegetative structures unique to playas, as well. However, removing use concentration from one area would likely cause an increase in concentration elsewhere, which would remove vegetation and increase trampling in a different location.

Modification of livestock management through a variety of practices, including changes in timing, duration, and intensity, allows for flexibility by managers to achieve DFCs for habitat, of which vegetation condition and type is a major component. This would enhance vegetation by considering and implementing those management actions to achieve DFCs. Seasonal uses may include spring, summer, fall, or winter grazing. Spring grazing occurs when plants are utilizing soil moisture to initiate growth. Dormancy ends around March, when early season plants, such as false dandelion, cheatgrass, and bluegrass, initiate growth. This gradates across the Monument from south to north, and varies from year to year dependent on precipitation, temperature, and weather patterns. Heavy spring grazing can reduce forbs and perennial grasses, when repeated every year without deferment or rest. Defoliation of cool-season bunchgrasses can be damaging if it is excessive, occurs during the main growth period, and substantial regrowth following the defoliation is prevented by inadequate moisture. However, grazing plants after flowering helps avoid the reduced regrowth and root mass reduction that can manifest in plants defoliated during the emergence of the flowering stalk [Ganskopp, 1988]. Limited early spring grazing may be more beneficial than limited later spring grazing [Brewer, Mosley, Lucas, & Schmidt, 2007]; [Ganskopp, 1998]. Heavy spring grazing by sheep has been shown to increase sagebrush dominance, but can reduce bitterbrush, bunchgrass, and forb production. Cheatgrass control through grazing could occur in the spring; however, grazing that reduces annuals can also reduce perennial grasses. A reduction in perennial grasses can result in increased annual grass presence by expanding the niche annuals need to thrive. Grazing in cheatgrass could reduce flame lengths and burn severity, but not necessarily the rate of spread [Diamond, Call, & Devoe, 2009], grazing effectiveness as a fire hazard reduction tool would be dependent on a variety of factors, including timing, duration, and intensity [Nader, Henkin, Smith, Ingram, & Narvaez, 2007].

Summer in the planning area is associated with hotter, drier conditions, and completion of plant growth cycles. Early season perennial grasses such as Sandberg bluegrass, and annual grasses, such as cheatgrass or sixweeks fescue, would have completed their life cycle for the season, and either have set seed and entered dormancy or have died. Mid-size perennial bunchgrasses, such as bluebunch wheatgrass or crested wheatgrass, would be reaching the end of their seasonal cycles, likely ranging from seed set to seed shatter stages. Grasses and forbs are more tolerant to livestock grazing at this stage than during active growth, which typically occurs through late spring and into summer.

Fall grazing can maintain the existing plant community, and improve bunchgrass production, although improvement in forb production is variable. Heavy fall grazing by sheep may reduce sagebrush [Laycock, 1967]; [Laycock, 1979]. A source for the desirable vegetation also must be present in order to accomplish an increase in the desired component [Laycock, 1967]; [Laycock, 1979].

Winter grazing could occur in the planning area. However, residual vegetation is important in the winter to capture snow and incorporate winter moisture into the soil profile. Winter use has little effect on most vegetation because it occurs in a time before soil moisture has been depleted and plants are dormant. Cool temperatures and improved natural water availability in the spring, fall, and winter can create an ideal situation for improved livestock dispersal, reducing livestock congregation. However, extreme weather conditions can cause livestock to congregate on available water and feed areas, which can create impacts to vegetation through soil compaction and vegetation reduction at localized areas.

Spring and early summer are typically the periods of most active plant growth in the Monument. Avoiding livestock utilization in spring or early summer in nesting or early brood-rearing habitats would eliminate impacts from livestock grazing to those plant communities that support those habitat types. Grazing restrictions would either reduce or entirely eliminate utilization of plants, soil compaction, and trampling of plants associated with use at livestock congregation areas, such as mineral supplement or water sites. However, this use could be displaced or increased to new or existing areas in the Monument, and could occur in different seasons.

Retiring an allotment would make the area unavailable for livestock grazing. Impacts would vary depending on the current condition of the vegetation and if multiple permits were retired in the allotment or only a few permits were affected.

Livestock grazing can affect vegetation composition and structure by removing biomass, affecting height and plant shape, and limiting growth. It can also be used to facilitate establishment of certain plants, such as shrubs, or have a minor impact to vegetation by grazing after the plant has completed its annual growth cycle, as discussed previously.

Under Alternative B, management objectives would be focused on achieving vegetation composition and structure consistent with appropriate sage-grouse seasonal habitat objectives, relative to the site potential. Monitoring would be necessary to gauge the efficacy of a treatment or management action, and could be used to inform adjustments to livestock use through management. Monitoring vegetation encompasses a broad spectrum of timing; frequency and appropriate methods should be determined by following BLM technical reference recommendations.

Alternative B allows grazing management to be adjusted as appropriate during drought to provide for adequate food and cover for sage-grouse. Drought can affect vegetation by forcing dormancy, reducing production, and stressing plants by taxing carbohydrate reserves. As a result, plant vigor diminishes. Longer deferment may be necessary in droughty conditions [Brewer et al., 2007]; [Ganskopp, 1998]. Adjusting grazing during periods of drought can alleviate additional stress associated with biomass removal during critical growth periods. Additionally, plants may enter dormancy sooner than in a non-drought year. Once dormancy has been entered, impacts to plants from grazing may diminish.

Different plant species are affected to varying degrees from livestock grazing during a drought. The effect of drought on vegetation varies depending on the extent and severity of the drought.

For instance, Idaho fescue is more readily impacted by livestock grazing during a drought than crested wheatgrass [Ganskopp & Bedell, 1981]. The impacts to vegetation following a drought may not manifest until years following the drought. Responses will vary depending on the utilization received, including timing, duration, and intensity, as well as other natural variables, such as the extent of the drought and pre-drought vegetation condition.

Conversion in kind of livestock would be allowed in Alternative B, and would occur through an implementation/project level analysis. This would be completed to identify impacts, to determine if DFCs will be met through the conversion, and to ensure management objectives of the 2007 MMP are met. Different kinds of livestock utilize forage in different manners, and can impact plant communities to different degrees. For instance, sheep will utilize browse species such as bitterbrush, and may select for forbs in spring and early summer, while cattle favor grazing grasses, although species preference varies throughout the year. In certain cases, a different kind of livestock may be a desirable change in order to achieve a DFC for vegetation condition, which is not achievable through the currently authorized kind of livestock.

### **Vegetation: Alternative C**

#### ***Water Resources Management Actions***

Vegetation components are a critical factor in the health, resilience, and condition of a riparian area. Improper timing and duration of livestock grazing can contribute to the removal of desirable vegetation in a riparian area, which can contribute to a decline in the functioning of the system. However, management of grazing to achieve Standards, and continued feedback through monitoring would reduce landscape level impacts and allow for achievement of DFCs.

Alternative C would allow the suspension or modification of livestock grazing if it is determined to be a factor in not meeting riparian or watershed Standards or if it is necessary to meet DFC. Vegetation is a critical component in the functionality of a riparian system. It acts to disperse overland flows, trap sediment, stabilize and protect banks, and provide diverse species for wildlife cover and forage needs [USDI, 2006]. Multiple studies have been completed regarding riparian area vegetation responses to livestock grazing. Treatment factors vary as much as responses, but timing, duration, and intensity are the three common factors of change implemented to derive a response in plant species diversity and system stabilization [USDI BLM, 2006]. Adjusting livestock grazing at the implementation level to meet PFC would meet the DFCs of riparian areas as outlined in the Monument plan.

#### ***Vegetation Resources Management Actions***

AUMs are higher in Alternative C than in Alternative B, and are roughly the same as Alternative A. Also, approximately 500 acres more of Dry Non-Native Perennial vegetation (non-native perennial seedings) are available for grazing in Alternative C than in Alternative B. Overall, though, this is a minor acreage amount. Flexibility in grazing duration, intensity, and timing is encouraged as part of Alternative C, in order to meet DFCs. Like Alternative B, grazing would be prioritized on non-native perennial seedings. Established, non-native perennial seedings function to reduce soil movement from both water and wind erosion, and limit invasive species expansion and establishment. They are resilient to disturbances and are more able to withstand moderate to heavy grazing than mid-size native perennial bunchgrasses. This focused grazing could create an opportunity for increases in other plants, such as sagebrush, but only if a seed source was present. Heavy grazing could also lead to mortality of juvenile shrubs through trampling [Laycock, 1967]; [Laycock, 1979]. Grazing intensity and duration would be determined through site-specific

NEPA analysis compliance. Invasive annual plants would vary in response to increased grazing pressures, dependent on timing, duration, and intensity. For instance, cheatgrass seed density can be reduced by clipping to a short height (2.5 cm) after the flowering stage but before the seed ripens. Cheatgrass left taller than that has almost no effect on seed density, when compared to non-grazed plants. Grazing plants to this height may be most effective if grazed a second time when/if the inflorescence emerges following regrowth [Hempy-Mayer & Pyke, 2008].

Alternative C would allow for up to 1,000 acres of reference sites, or study areas, to be established throughout the Monument. Study areas, such as paired plots, are a commonly used tool to measure effectiveness of, or differences between vegetation treatments. Livestock grazing would be the treatment difference between the exclosure area and the area continuing to be grazed. Setting up paired plots would allow the opportunity to study grazing effects across a broad range of plant communities, with varying composition, climatic gradients, and ranging issues. Fencing would be necessary to create a study plot, and can lead to short-term moderate effects to vegetation in a localized area through crushing and removing plants to allow for installation. Since the intention of the study is to see effects of grazing treatments, areas could be subjected to heavier or directed grazing for varying durations in order to measure an effect. This could lead to short-term moderate impacts, depending on the degree of vegetation removal, timing and duration, and the current condition of a plant community. These effects would be controlled to a limited area, as related to the scope of the study. As part of a paired plot, there would also be a portion of the study area subjected to less intensive or no grazing.

### ***Livestock Management Actions***

Alternative C makes 300 additional acres unavailable to grazing (1,500 acres total) when compared to Alternative A. These include areas that are in good vegetative condition, and are not identified as needing treatment in the 2007 MMP. Removing areas from livestock grazing would maintain the current condition of those plant communities as related to any composition shifts that may be related to livestock grazing; however, natural processes would continue, such as wildfire, and the plant community would respond as expected in a dynamic system [Davies et al., 2014].

Utilization at the full allocated AUM level would result in an increase in disturbances related to livestock grazing compared to the average actual use, but similar to the fully utilized No Action Alternative. These could include increases to the number and location of existing bed grounds, increased mineral placement, and an increase in, consolidation of, or a change in the location of water haul sites. These are localized disturbances. Vegetation in newly established sites would be expected to follow the trend of past placement - reduced vegetative cover, increased noxious weeds and invasive plant species, and soil compaction. These impacts are most observable in the localized disturbance footprint, which normally ranges from as small as just surrounding the concentration area to one-half mile out.

Changes to livestock-related infrastructure are anticipated through this alternative in order to manage potential increased utilization, and also to incorporate a wider range of seasons of use and management schemes to meet the DFCs. These increases or changes in placement would have localized impacts, but overall would be anticipated to improve the vegetation condition, as part of the DFCs. The site-specific impacts of infrastructure changes would be assessed and analyzed during the permit renewal process.

Grazing can alter the vegetation community. The potential to affect soil stability or increase noxious weeds and invasive plant species must be considered when actively utilizing livestock grazing to maintain, enhance, or restore vegetation condition. Grazing has the potential to

increase soil compaction, and the feasibility to implement the necessary level of grazing intensity and duration on a landscape scale can be limiting factors in utilizing grazing as a restoration/rehabilitation tool. Grazing could be used as one of many tools in a restoration program.

Livestock can be managed to achieve habitat DFCs through manipulating the timing, duration, and intensity of grazing. This requires the flexibility to change grazing practices in response to vegetation condition and type. Incorporating this flexibility and specific objectives into Allotment Management Plans after Land Health Assessments would allow grazing to be used as a tool to enhance or restore vegetation condition. Vegetation changes can be directed through a variety of management actions, including changing timing of use, stocking rate, scheduling rest or deferment, livestock numbers, kind, and distribution. This would enhance vegetation by considering and implementing those management actions to achieve DFCs. Seasonal uses may include spring, summer, fall, or winter grazing. Spring grazing occurs when plants are utilizing soil moisture to initiate growth. Dormancy ends around March, when early season plants, such as false dandelion, cheatgrass and bluegrass, initiate growth. This gradates across the Monument from south to north, and varies from year to year dependent of precipitation, temperature, and weather patterns. Heavy spring grazing can reduce forbs and perennial grasses, when repeated every year without deferment or rest. Defoliation of cool-season bunchgrasses can be damaging if it occurs during the main growth period and substantial regrowth following the defoliation is prevented by inadequate moisture. However, grazing plants after flowering helps avoid the reduced regrowth and root mass reduction that can manifest in plants defoliated during the emergence of the flowering stalk [Ganskopp, 1988]. Limited early spring grazing may be more beneficial than limited later spring grazing [Brewer et al., 2007]; [Ganskopp, 1998]. Heavy spring grazing by sheep has been shown to increase sagebrush dominance, but can reduce bitterbrush, bunchgrass, and forb production. Cheatgrass control through grazing would be targeted in the spring; however, grazing that adversely affects annuals can also reduce perennial grasses, which can result in increased annual grass by expanding the niche annuals need to thrive. Grazing in cheatgrass could reduce flame lengths and burn severity, but not necessarily the rate of spread [Diamond, Call, & Devoe, 2009], grazing effectiveness as a fire hazard reduction tool would be dependent on a variety of factors, including timing, duration, and intensity [Nader, Henkin, Smith, Ingram, & Narvaez, 2007.]

Winter grazing could occur in the planning area. However, residual vegetation is important in the winter to capture snow and incorporate winter moisture into the soil profile. Winter use has little effect on most vegetation because it occurs in a time before soil moisture has been depleted and plants are dormant. Cool temperatures and improved natural water availability in the spring, fall, and winter can create an ideal situation for improved livestock dispersal, reducing livestock congregation. However, extreme weather conditions can cause livestock to congregate on available water and feed areas, which can create impacts to vegetation through soil compaction and vegetation reduction at localized areas.

Fall grazing can maintain the existing plant community, and improve bunchgrass production, although improvement in forb production is variable. Heavy fall grazing by sheep may reduce sagebrush [Laycock, 1967]; [Laycock, 1979]. A source for the desirable vegetation also must be present in order to accomplish an increase in the desired component [Laycock, 1967]; [Laycock, 1979].

Summer in the planning area is associated with hotter and drier conditions, and completion of plant growth cycles. Early season perennial grasses such as Sandberg bluegrass, and annual grasses,

such as cheatgrass or sixweeks fescue, would have completed their life cycle for the season, and either have set seed and entered dormancy or have died. Mid-size perennial bunchgrasses, such as bluebunch wheatgrass or crested wheatgrass, would be reaching the end of their annual growth cycles, likely ranging from seed set to seed shatter stages. Plants are more tolerant to livestock grazing at this stage than during active growth, which typically occurs in the late spring.

Spring and early summer are typically the periods of most active plant growth in the Monument. Avoiding livestock utilization during spring or early summer in nesting or early brood-rearing habitats would reduce impacts from livestock grazing to plant communities that support those habitat types. Grazing restrictions would reduce utilization of plants, soil compaction, and trampling of plants associated with use at livestock-congregation areas, such as mineral or water sites.

Drought can affect vegetation by forcing dormancy, reducing production, and stressing plants by taxing carbohydrate reserves. As a result, plant vigor diminishes. Adjusting grazing during periods of drought can alleviate additional stress associated with biomass removal during critical growth periods. For instance, to maintain mid-size native perennial bunchgrasses, such as bluebunch wheatgrass or Thurber needlegrass, limit consecutive late spring/early summer defoliation to two years or less. Longer deferment may be necessary in droughty conditions [Brewer et al., 2007]; [Ganskopp, 1998].

Different plant species are affected to varying degrees from livestock grazing during a drought. The effect of drought on vegetation varies depending on the extent and severity of the drought [Ganskopp & Bedell, 1981]. For instance, Idaho fescue is more readily impacted by livestock grazing during a drought than crested wheatgrass is. The impacts to vegetation following a drought may not manifest until years following the drought. Responses will vary depending on the utilization received, including timing, duration, and intensity, as well as other natural variables, such as the extent of the drought and pre-drought vegetation condition.

Impacts from fence and associated infrastructure removal would be the same as discussed in Alternative A.

Impacts from allotment retirement and forage reserve would be the same as discussed in Alternative A.

Livestock infrastructure development impacts in the Bowl Crater Allotment and the North Pasture of the Laidlaw Park Allotment would be the same as discussed in Alternative A.

Kimama Allotment would gain 40 acres of non-Monument lands. Poison Lake Allotment would gain nearly 800 acres of Monument lands. 80% is Dry Non-Native Perennial Grassland, and nearly 20% is Dry Non-Native Annual Grassland. Shifts to the allotment boundaries are likely to incur the same impacts to vegetation through utilization by livestock.

Livestock grazing is an action that is associated with removal of vegetation, trampling, and some soil disturbance, especially when it occurs in conjunction with concentrated-use areas. Avoiding placement of concentration areas near sensitive cultural resources would help protect these resources by dispersing use on vegetation and soils in the area, thus retaining vegetation cover and soil intactness. This would help protect the sensitive soil and vegetative structures unique to playas, as well. However, removing use concentration from one area would likely cause an increase in concentration elsewhere, which would remove vegetation and increase trampling in a new or existing location.

Livestock grazing can affect vegetation composition and structure by removing biomass, affecting height and plant shape, and limiting growth. It can also be used to facilitate establishment of certain plants, such as shrubs, or have a minor impact to vegetation by grazing after the plant has completed its annual growth cycle, as discussed previously.

Alternative C will have reference area studies on effects of livestock grazing on different vegetation communities/condition. Each ungrazed reference area would be paired with an adjacent area which has been grazed. Monitoring vegetation encompasses a broad spectrum of timing, and frequency should be determined by following BLM technical reference recommendations. Monitoring is necessary to gauge the efficacy of a treatment or management action, and can be used to inform adjustments to use through management.

LHAs and other monitoring data can help to determine the direction a vegetation community is trending, and why, on a management unit level. Permit modifications can allow management objectives to be developed at that level, address the issues brought forth during LHAs, and define how management objectives and DFCs from the MMP level will be addressed.

Conversion in kind of livestock involves changing from one species of livestock to another and would be an allowed action in this alternative. An environmental assessment would be completed to identify impacts, to determine if DFCs will be met through the conversion, and to ensure management objectives of the 2007 MMP are met. Different kinds of livestock utilize forage in different manners, and can impact plant communities to different degrees. In certain cases, a different kind of livestock may be a desirable change in order to achieve a DFC for vegetation condition, which is not achievable through the currently authorized kind of livestock.

Water development practices have changed over the last few decades in ways that can enhance riparian vegetation. This includes trough placement, fencing, returning or cycling overflow water through the riparian area, and improved spring box designs. Improvements to current water systems, and moving troughs out of riparian areas would improve the vegetation condition at those sites by reducing trampling and improving the efficiency of natural water use as a stock water source.

Impacts from grazing management measures designed to meet sage-grouse habitat objectives would be the same as in Alternative B, with the exception that grazing would be allowed on 16,000 more acres of the Monument (See Table 4.2, “BLM Acres of Vegetation Available to Livestock, by Alternative”).

## **Vegetation: Alternative D**

### ***Livestock Management Actions***

In Alternative D, all BLM lands in the Monument would be made unavailable for livestock grazing use. This would include all types of use and all seasons of use — winter, spring, summer, and fall. State and private lands (approximately 2% of the total Monument area, or 14,800 acres) would still be accessed and available for grazing use.

Livestock grazing infrastructure on BLM-managed lands would be identified and prioritized for removal, rehabilitation, or restoration. Further infrastructure may be needed to keep livestock from using the Monument lands that are unavailable for grazing.

Roads and ways would continue to be maintained and accessed for recreational use, fire suppression, and restoration or rehabilitation activities in the Monument.

Immediate changes around bed grounds and water haul sites would include an increase in vegetation, both perennial and annuals. Noxious weeds and invasive plant species that may have been present in smaller amounts on the site will have an opportunity to expand in these disturbed sites, as livestock grazing and trampling will not be present to provide an immediate, repetitive reduction in plant densities on these concentrated use areas. If perennials are present, the response in health and vigor will relate to the previous health of the plants and the degree of annual competition that develops. Removal of infrastructure would result in short-term impacts to vegetation by removal and destruction of vegetation, and compaction of soils, which can affect the ability of plant root systems to retain vigor and for native seedlings to establish successfully. An expanded opportunity for increases in noxious weeds and invasive plant species would be created at these disturbances. Restoration through weed control and seeding may be necessary to reestablish a desirable plant composition.

Vegetation responses from livestock removal would also vary depending on the state of the community prior to the end of grazing. For instance, sites that have crossed a threshold to a new state, one dominated by low-stature perennial grasses and invasive annual plants, would currently have low biotic integrity and be less productive. Other sites may have transitioned to a new state dominated by seeded species, and may have limited diversity compared to an intact, native site. For both of these site types, higher levels of input than simply removing livestock grazing are required in order to transition these states to a more resilient, or native plant community. It is unlikely that these sites contain the integrity and resiliency to regain a native plant community type unless major inputs are involved. These landscape level inputs are dependent on program development and funding availability. A source for the desirable vegetation must be present in order to accomplish an increase in the desired component [Laycock, 1967]; [Laycock, 1979]. Davies et al. (2014) states that “in the absence of fire, well-managed livestock grazing and long-term grazing exclusion often produce similar plant community composition, productivity, and densities”.

Livestock grazing would not be authorized in Laidlaw Park under Alternative D. This area has a wide range of plant communities, as related to the variable soil types and temperature, elevation, and precipitation gradients. For instance, the south end of Laidlaw Park is sandy-loam soils at roughly 4,500 feet elevation, and receives 10-12 inches of precipitation yearly. This fosters a native plant community that includes bluebunch wheatgrass, needle-and-thread grass, Indian ricegrass, Wyoming or basin big sagebrush, and Picabo milkvetch. In comparison, the north end of Laidlaw Park is comprised of loamy soils, roughly 5,500 feet elevation, and averages 12-16 inches of precipitation in a year. Plant communities are dominated by mountain big sagebrush or three-tip sagebrush, bluebunch wheatgrass, Idaho fescue, and basalt milkvetch. Pockets of shrubby aspen and chokecherry are also found in this area. Throughout the entire Park, are scattered rangeland seedings varying from predominantly crested wheatgrass to native cultivars used after wildfires for emergency stabilization. Cheatgrass is a major vegetation component in some parts of the Park, decreasing in response to increasing precipitation and elevation, decreasing temperatures, and different soil types. The response to no grazing across Laidlaw Park would vary as dramatically as the vegetation communities.

Biological soil crusts are an important component of nutrient cycling in semi-arid ecosystems, and are sensitive to disturbances, such as moderate to heavy livestock grazing pressures or concentrated use areas. However, recovery of biological soil crusts can take 20-125 years to complete, once an area has been protected from disturbance [Belnap, 2003]. Natural recovery of vascular and nonvascular species following the removal of livestock grazing could potentially



take longer than the life of the plan, depending on the state of the community prior to the end of grazing.

Noxious weed control and invasive plant species distribution is an issue that is not related solely to livestock grazing. The dispersal and spread of noxious weeds is also dependent on the visitor use for resources offered in the Monument (e.g. hunting, camping, and OHV use), as well as natural transportation means, such as wind, birds, and other wildlife. Disturbances such as wildfires can create a niche that allows for establishment or expansion of noxious weeds and invasive plant species. However, livestock can contribute to the dispersal of weed seeds and materials through feed consumption, seeds can be transported by livestock coats, and also by vehicles and equipment related to livestock grazing. Certified weed-free hay is required on all BLM lands [USDI BLM, 2011].

Weed management is a long-term commitment of resources and time across land ownerships. Prevention is the most cost-effective treatment, but is not always the most plausible solution since noxious weeds and invasive plant species are present in varying degrees across much of the Monument. Complete removal of livestock use from the Monument would only be an effective solution to the weed expansion and introduction if all other uses were removed simultaneously and control/containment measures were put into place by all ownerships. In areas where invasive species, such as cheatgrass, are already present as a low component of the vegetation, immediate cessation of large domestic ungulate grazing may in fact allow a flush in cheatgrass density to occur [Courtois, Perryman, & Hussein, 2004].

Restoration objectives and treatments would be carried forward from the current MMP. Plant community changes may reflect episodic climatic events – no change may be evidenced for a long period of time, and then a sudden measurable response will manifest [Valone, Meyer, Brown, & Chew, 2002]. It is difficult to estimate the time required to achieve a measurable vegetation change in response to removal of livestock grazing, especially without inputs from other sources. Vegetation changes may or may not be in a positive direction, in relationship to the DFCs outlined in the 2007 MMP. Currently, about 70% of the Monument is estimated to be in a vegetation condition that would require active restoration efforts to return to a climax plant community state. The majorities of these areas are functioning as stable states, in relation to hydrologic and biotic cycling, and are providing quality habitat for a variety of wildlife species' different lifecycle needs. About 25% of the Monument exhibits slight departure from the climax plant community. This departure is related to naturally occurring disturbances, such as wildfire, and is responding as expected in a dynamic system. Nearly 5% of the Monument is consistent with a climax plant community in relation to ESDs.

Cheatgrass control through grazing would not occur and assuming that funding trends would not dramatically shift for the fire management or fuels program - response times and fuels reduction treatments (not including any type of grazing) would be similar to what has occurred in the past. Meanwhile, fine fuel loading and continuity would increase without the reductions from a well-managed grazing program and would result in increased rates of spread, flame lengths, and final fire size [Strand et al., 2014].

## **Vegetation: Alternative E**

### ***Water Resources Management Actions***

Vegetation components are a critical factor in the health, resilience, and condition of a riparian area. Improper timing and duration of livestock grazing can contribute to the removal of

desirable vegetation in a riparian area, which can contribute to a decline in the functioning of the system. However, management of grazing to achieve Standards, and continued feedback through monitoring would reduce landscape level impacts and allow for achievement of DFCs.

Alternative E would allow the suspension or modification of livestock grazing if it is determined to be a factor in not meeting riparian or watershed Standards. Vegetation is a critical component in the functionality of a riparian system. It acts to disperse overland flows, trap sediment, stabilize and protect banks, and provide diverse species for wildlife cover and forage needs [USDI, 2006].

Multiple studies have been completed regarding riparian area vegetation responses to livestock grazing. Treatment factors vary as much as responses, but timing, duration, and intensity are the three common factors of change implemented to derive a response in plant species diversity and system stabilization [USDI BLM, 2006]. Adjusting livestock grazing at the implementation level to meet PFC would meet the DFCs of riparian areas as outlined in the Monument plan.

### ***Vegetation Resources Management Actions***

Allocated AUMs are higher in Alternative E than in Alternative B, and are roughly half of what is allocated Alternatives A and C. Also, approximately 500 acres more of Dry Non-Native Perennial vegetation (non-native perennial seedings) is available in Alternative E than in Alternative B. Overall, though, this is a minor acreage amount. Flexibility in grazing duration, intensity, and timing are encouraged as part of Alternative E, in order to meet DFCs. Like Alternative B, grazing would be prioritized on non-native perennial seedings. Established, non-native perennial seedings function to reduce soil movement from both water and wind erosion, and limit invasive species expansion and establishment. They are resilient to disturbances and are more able to withstand moderate to heavy grazing than mid-size native perennial bunchgrasses. This focused grazing could create an opportunity for increases in other plants, such as sagebrush, but only if a seed source was present.

Heavy grazing is not anticipated other than within small areas around range improvements if this happens it could lead to mortality of juvenile shrubs through trampling [Laycock, 1967]; [Laycock, 1979]. Grazing intensity and duration would be determined through site-specific NEPA analysis compliance and maintained through achievement of Standards. Invasive annual plants would vary in response to increased grazing pressures, dependent on timing, duration, and intensity.

For instance, cheatgrass seed density can be reduced by clipping to a short height (2.5 cm) after the flowering stage but before the seed ripens. Cheatgrass left taller than that has almost no effect on seed density, when compared to non-grazed plants. Grazing plants to this height may be most effective if grazed a second time when/if the inflorescence emerges following regrowth [Hempy-Mayer & Pyke, 2008].

Alternative E, as in C, would allow for up to 1,000 acres of reference sites, or study areas, to be established throughout the Monument. Study areas, such as paired plots, are a commonly used tool to measure effectiveness of, or differences between vegetation treatments. Livestock grazing would be the treatment difference between the exclosure area and the area continuing to be grazed.

Setting up paired plots would allow the opportunity to study grazing effects across a broad range of plant communities, with varying composition, climatic gradients, and ranging issues.

Fencing would be necessary to create a study plot, and can lead to short-term moderate effects to vegetation in a localized area through crushing and removing plants to allow for installation. Since the intention of the study is to see effects of grazing treatments, areas could be subjected to heavier or directed grazing for varying durations in order to measure an effect. This could lead to short-term moderate impacts, depending on the degree of vegetation removal, timing and duration, and the current condition of the local plant community. These effects would be controlled to a limited area, as related to the scope of the study. As part of a paired plot, there would also be a portion of the study area subjected to less intensive or no grazing.

### ***Wildlife and Fish Resources Management Actions***

Impacts under Alternative E are the same as Alternative A.

### ***Livestock Management Actions***

The areas made unavailable to livestock in Alternative E are the same as the areas identified in Alternative A and C, with the addition of Larkspur Park (2,200 acres total). These include areas that are in good vegetative condition, and are not identified as needing treatment in the 2007 MMP. Removing areas from livestock grazing would maintain the current condition of those plant communities as related to any composition shifts that may be related to livestock grazing; however, natural processes would continue, such as wildfire, and the plant community would respond as expected in a dynamic system [Davies et al., 2014].

Allocation at the full permitted AUM level would be similar to the current use levels recorded in the last 15 years of use. This would result in a no net increase in disturbances related use from livestock grazing. Vegetation in newly established sites would be expected to follow the trend of past.

Grazing can alter the vegetation community. The potential to affect soil stability or increase noxious weeds and invasive plant species must be considered when actively utilizing livestock grazing to maintain, enhance, or restore vegetation condition. Grazing has the potential to increase soil compaction, and the feasibility to implement the necessary level of grazing intensity and duration on a landscape scale can be limiting factors in utilizing grazing as a restoration/rehabilitation tool. Grazing could be used as one of many tools in a restoration program.

Livestock can be managed to achieve habitat DFCs through manipulating the timing, duration, and intensity of grazing. This requires the flexibility to change grazing practices in response to vegetation condition and type. Incorporating this flexibility and specific objectives into Allotment Management Plans after Land Health Assessments would allow grazing to be used as a tool to enhance or restore vegetation condition. Vegetation changes can be directed through a variety of management actions, including changing timing of use, stocking rate, scheduling rest or deferment, livestock numbers, kind, and distribution. This would enhance vegetation by considering and implementing those management actions to achieve DFCs. Seasonal uses may include spring, summer, fall, or winter grazing. Spring grazing occurs when plants are utilizing soil moisture to initiate growth. Dormancy ends around March, when early season plants, such as false dandelion, cheatgrass and bluegrass, initiate growth. This gradates across the Monument from south to north, and varies from year to year dependent of precipitation, temperature, and weather patterns. Heavy spring grazing can reduce forbs and perennial grasses, when repeated every year without deferment or rest. Defoliation of cool-season bunchgrasses can be damaging if it occurs during the main growth period and substantial regrowth following the defoliation is

prevented by inadequate moisture. However, grazing plants after flowering helps avoid the reduced regrowth and root mass reduction that can manifest in plants defoliated during the emergence of the flowering stalk [Ganskopp, 1988]. Limited early spring grazing may be more beneficial than limited later spring grazing [Brewer et al., 2007]; [Ganskopp, 1998]. Heavy spring grazing by sheep has been shown to increase sagebrush dominance, but can reduce bitterbrush, bunchgrass, and forb production. Cheatgrass control through grazing would be targeted in the spring; however, grazing that adversely affects annuals can also reduce perennial grasses, which can result in increased annual grass by expanding the niche annuals need to thrive. Grazing in cheatgrass could reduce flame lengths and burn severity, but not necessarily the rate of spread [Diamond, Call, & Devoe, 2009], grazing effectiveness as a fire hazard reduction tool would be dependent on a variety of factors, including timing, duration, and intensity [Nader, Henkin, Smith, Ingram, & Narvaez, 2007.]

Winter grazing could occur in the planning area. However, residual vegetation is important in the winter to capture snow and incorporate winter moisture into the soil profile. Winter use has little effect on most vegetation because it occurs in a time before soil moisture has been depleted and plants are dormant. Cool temperatures and improved natural water availability in the spring, fall, and winter can create an ideal situation for improved livestock dispersal, reducing livestock congregation. However, extreme weather conditions can cause livestock to congregate on available water and feed areas, which can create impacts to vegetation through soil compaction and vegetation reduction at localized areas.

Fall grazing can maintain the existing plant community, and improve bunchgrass production, although improvement in forb production is variable. Heavy fall grazing by sheep may reduce sagebrush [Laycock, 1967]; [Laycock, 1979]. A source for the desirable vegetation also must be present in order to accomplish an increase in the desired component [Laycock, 1967]; [Laycock, 1979].

Summer in the planning area is associated with hotter and drier conditions, and completion of plant growth cycles. Early season perennial grasses such as Sandberg bluegrass, and annual grasses, such as cheatgrass or sixweeks fescue, would have completed their life cycle for the season, and either have set seed and entered dormancy or have died. Mid-size perennial bunchgrasses, such as bluebunch wheatgrass or crested wheatgrass, would be reaching the end of their annual growth cycles, likely ranging from seed set to seed shatter stages. Plants are more tolerant to livestock grazing at this stage than during active growth, which typically occurs in the late spring.

Spring and early summer are typically the periods of most active plant growth in the Monument. Avoiding livestock utilization during spring or early summer in nesting or early brood-rearing habitats would reduce impacts from livestock grazing to plant communities that support those habitat types. Grazing restrictions would reduce utilization of plants, soil compaction, and trampling of plants associated with use at livestock-congregation areas, such as mineral or water sites.

Drought can affect vegetation by forcing dormancy, reducing production, and stressing plants by taxing carbohydrate reserves. As a result, plant vigor diminishes. Adjusting grazing during periods of drought can alleviate additional stress associated with biomass removal during critical growth periods. For instance, to maintain mid-size native perennial bunchgrasses, such as bluebunch wheatgrass or Thurber needlegrass, limit consecutive late spring/early summer defoliation to two years or less. Longer deferment may be necessary in droughty conditions [Brewer et al., 2007]; [Ganskopp, 1998].

Different plant species are affected to varying degrees from livestock grazing during a drought. The effect of drought on vegetation varies depending on the extent and severity of the drought [Ganskopp & Bedell, 1981]. For instance, Idaho fescue is more readily impacted by livestock grazing during a drought than crested wheatgrass is. The impacts to vegetation following a drought may not manifest until years following the drought. Responses would vary depending on the utilization received, including timing, duration, and intensity, as well as other natural variables, such as the extent of the drought and pre-drought vegetation condition. Impacts from fence and associated infrastructure removal would be the same as discussed in Alternative A. Impacts from allotment retirement and reserve forage would be the same as discussed in Alternative A.

Livestock infrastructure development and disturbance from livestock related infrastructure would not have a net gain in disturbance. Any new infrastructure must follow previously established corridors/areas or will be offset by restoring/rehabilitating disturbance elsewhere. Fences and pipeline must be within 20 feet of the center of a primitive road or 30 feet from the center of a road. Troughs, wells and corrals must be within historically used sites identified prior to project.

Kimama Allotment would gain 40 acres of non-Monument lands. Poison Lake Allotment would gain nearly 800 acres of Monument lands. 80% is Dry Non-Native Perennial Grassland, and nearly 20% is Dry Non-Native Annual Grassland. Shifts to the allotment boundaries are likely to incur the same impacts to vegetation through utilization by livestock.

Livestock grazing is an action that is associated with removal of vegetation, trampling, and some soil disturbance, especially when it occurs in conjunction with concentrated-use areas. Avoiding placement of concentration areas near sensitive cultural resources would help protect these resources by dispersing use on vegetation and soils in the area, thus retaining vegetation cover and soil intactness. This would help protect the sensitive soil and vegetative structures unique to playas, as well. However, removing use concentration from one area would likely cause an increase in concentration elsewhere, which would remove vegetation and increase trampling in a new or existing location.

Alternative E and C will have reference area studies on effects of livestock grazing on different vegetation communities/condition. Each ungrazed reference area would be paired with an adjacent area which has been grazed. Monitoring vegetation encompasses a broad spectrum of timing, and frequency should be determined by following BLM technical reference recommendations. Monitoring is necessary to gauge the efficacy of a treatment or management action, and can be used to inform adjustments to use through management.

LHAs and other monitoring data can help to determine the direction a vegetation community is trending, and why, on a management unit level. Permit modifications can allow management objectives to be developed at that level, address the issues brought forth during LHAs, and define how management objectives and DFCs from the MMP level will be addressed.

Conversion in kind of livestock involves changing from one species of livestock to another and would be an allowed action in this alternative. An environmental assessment would be completed to identify impacts, to determine if DFCs will be met through the conversion, and to ensure management objectives of the 2007 MMP are met. Different kinds of livestock utilize forage in different manners, and can impact plant communities to different degrees. In certain cases, a different kind of livestock may be a desirable change in order to achieve a DFC for vegetation condition, which is not achievable through the currently authorized kind of livestock.

Water development practices have changed over the last few decades in ways that can enhance riparian vegetation. This includes trough placement, fencing, returning or cycling overflow water through the riparian area, and improved spring box designs. Improvements to current water systems, and moving troughs out of riparian areas would improve the vegetation condition at those sites by reducing trampling and improving the efficiency of natural water use as a stock water source. Water development will follow the management objective of no net gain in infrastructure/improvements.

Impacts from grazing management measures designed to meet sage-grouse habitat objectives would be the same as in Alternative B, with the exception that grazing would be allowed on 16,000 more acres of the Monument (See Table 4.2, “BLM Acres of Vegetation Available to Livestock, by Alternative”).

#### **4.2.4. Wildlife and Fish, Including Special Status Species**

Wildlife habitat occurs on all public lands throughout the planning area. Fish habitat does not occur on BLM-administered lands available to livestock grazing in the Monument but could be influenced by BLM management inside the Monument. Most activities on public lands have the potential to adversely or beneficially impact wildlife and fish and their habitats. Impacts to wildlife and fish species are generally described as the loss, modification, or degradation/improvement of habitat or key habitat features; the disturbance/disruption of individuals during sensitive time periods; or direct animal mortality. Adverse impacts to special status species and their habitats are usually of more concern than impacts to general wildlife and fish because of the limited nature of their numbers, habitat, or unique threats. The analysis boundary for wildlife (excluding bighorn sheep) and fish is defined as the planning area, but also considers overlapping grazing allotments and coinciding watersheds (IDEQ 6th field HUCs) because these areas could be indirectly affected by BLM management inside the Monument. The analysis boundary for bighorn sheep considers the IDFG bighorn sheep PMUs which occur within the spatial boundary of the Risk of Contact Tool (22 miles).

##### **4.2.4.1. Summary**

Alternative A proposes the most acres of land available to livestock grazing and no change to currently permitted AUM levels. Alternative A would likely meet objectives and DFCs for the planning area because the distribution, abundance, and quality of wildlife habitats would be maintained or improved over the long term. Managing for Standards would have a landscape-level benefit to wildlife and fish resources. However, the lack of implementation-level guidance concerning livestock grazing management could result in minor adverse impacts on wildlife and fish as habitat degradation would likely persist in localized areas, such as sheep bed grounds and livestock supplement sites. Management actions are incorporated for sage-grouse as identified in the approved ID/SW MT Greater Sage-Grouse Plan Amendment, which would minimize impacts to sage grouse and their habitats. The provisions of this plan amendment are common to all alternatives. These management action are expected to benefit other sensitive wildlife resources as well, particularly sagebrush associates.

Alternative B would result in a significant reduction of both acres and AUMs available to livestock grazing and would likely result in minor to moderate beneficial impacts to wildlife resources. Areas closed to grazing would make the most progress toward achieving the goals and DFCs for wildlife in the shortest time. Wildlife habitat would likely improve over current

conditions because the amount of structural range improvements and use of resources by livestock would decrease.

Alternative C would result in a minor reduction of acres and AUMs available to livestock grazing. Alternative C is similar in many respects to Alternative A, but Alternative C includes additional management actions that increase habitat protection in areas important to wildlife, especially special status species. Overall, Alternative C would likely result in minor to moderate beneficial impacts to wildlife and fish resources.

Alternative D would close the entire planning area to livestock grazing. This alternative would provide the greatest protection to resources from disturbances related to livestock grazing management, and therefore would likely result in minor to moderate beneficial impacts to wildlife and fish and their habitats. Upland wildlife would mostly benefit from the increased availability of forage and cover; aquatic species may benefit from the long-term improvement of riparian-wetland areas. Although interior fences coincident to livestock grazing (e.g., fences not on the planning area boundary) would be removed, the potential addition of fence to keep livestock out of the planning area could result in adverse impacts on wildlife in those areas.

Alternative E would result in a reduction of AUMs available to livestock grazing and would likely result in minor to moderate beneficial impacts to wildlife resources. Areas closed to grazing would make the most progress toward achieving the goals and DFCs for wildlife in the shortest time. Wildlife habitat would likely be maintained consistent with current conditions because the amount of structural range improvements and AUMs would be representative of maximum actual use levels.

#### **4.2.4.2. Assumptions**

- Areas closed or excluded to use or activity would not be impacted by that activity, whereas areas open or available would likely be influenced by the use or activity.
- Three general categories of human disturbance would be the most influential on wildlife and fish species and their habitats: 1) disturbance or disruption from casual use; 2) disturbance or disruption from permitted activity; and 3) changes in habitat condition.
- Special management based on season or distance (e.g., exclusion areas, avoidance areas with restrictions or stipulations) may eliminate, reduce, or promote some effects.
- Actions that reduce livestock grazing could cause livestock use patterns to shift, thereby increasing or decreasing use both inside and outside of the Monument.
- Altering livestock grazing patterns could impact wildlife or fish habitat and its use.
- Ground-disturbing activities and structural range improvements could positively or negatively modify wildlife habitat or cause loss or gain of individuals, depending on the size of the area disturbed, the nature of the disturbance, the species affected, and the location of the disturbance.
- Water developments can be a tool to improve grazing practices and habitat, but can expand adverse impacts of grazing to new areas.
- Management activities that result in impacts on vegetation would have a corresponding adverse or beneficial impact on wildlife or fish habitat.

- In general, as the number of AUMs increase, the amount of residual herbaceous cover would decrease because of increased consumption and trampling by livestock.
- The change in residual cover from grazing is not uniform across the landscape.
- Current year and/or residual herbaceous vegetation influences nesting, thermal, and security cover for wildlife.
- In general, areas with more herbaceous cover provide higher levels of nesting, thermal, or security cover for sage-grouse.
- Because sage-grouse are sensitive to habitat disturbance and require large, intact habitat patches to complete their annual life history, alternatives proposing to protect the most sage-grouse habitat from disturbance are considered of greatest beneficial impact to the species.
- Suitable habitat conditions for sage-grouse, as determined by employing methods outlined in the *Habitat Assessment Framework* [Stiver et al., 2015], are adequate to provide for the life-history requirements of the species.
- Seasonal ranges of sage-grouse are sufficiently mapped to provide an assessment of direct and indirect impacts to currently occupied habitats.
- Sage-grouse are an umbrella or indicator species for other sagebrush-associated special status wildlife including pygmy rabbits and passerine birds such as Brewer's sparrow, sagebrush sparrow, and loggerhead shrike [Hanser & Knick, 2011]. Therefore, actions taken to benefit sage-grouse are assumed to result in benefits to other sagebrush-associated species.
- The health of aquatic species is directly related to the overall health and functional capabilities of water resources.
- Riparian-wetland areas that have achieved PFC provide higher quality habitat for wildlife than areas that have not achieved PFC.
- Activities that cause substantial disturbance to soils and vegetation can adversely impact water quality and quantity, reducing habitat quality for fish that require clear water, moderated stream flows, and clean substrates.
- Consideration of aquatic habitat conditions when conducting BLM assessments, such as PFC and LHAs, will help to identify areas for habitat management efforts.

#### **4.2.4.3. How Activities Affect Wildlife and Fish**

##### ***Water Resources Management Actions***

Riparian-wetland areas and playas support the greatest biological diversity of all habitats in the planning area. Management actions that protect, restore, and improve these areas would result in beneficial impacts to wildlife, including aquatic species. Management of riparian-wetland areas to meet PFC and Standards would increase habitat diversity and water quality by increasing the structural and functional vegetation and decreasing sedimentation. Improving aquatic habitats would increase their suitability for many species, including big game, fur-bearing animals, small game, migratory game birds, neotropical migrants, amphibians, and invertebrates. Actions that provide for PFC would likely increase the production of terrestrial and aquatic insects, resulting



in improvements to amphibian populations, and providing additional foraging opportunities for other insect-eating wildlife. Areas managed to exceed the minimum requirement of PFC would result in greater beneficial impacts to wildlife, including aquatic species.

### ***Vegetation Resources Management Actions***

Modified and degraded landscapes can affect the carrying capacity and species richness of habitats by altering the amount of available cover, forage, and prey species for wildlife. In general, changes to vegetation, whether in quantity or quality, would have corresponding impacts on wildlife, including aquatic species. Under all alternatives, rangelands would be managed to meet Standards and for specific plant species and vegetative attributes, which would directly impact wildlife habitat. Plant communities lacking a balance of herbaceous and woody components would adversely impact wildlife in the planning area because most species depend on sagebrush/grass and mixed shrub communities, at least seasonally, to meet part of their forage, cover, or migration needs.

Management practices designed to promote the recovery of sagebrush could increase wildlife species diversity and richness, depending on different species' habitat requirements. Species that require late-seral habitat would benefit from the recovery and diversification of sagebrush steppe, while species that require early to mid-seral communities would lose habitat. Early-seral habitat is not currently limited on the Monument due to wildfire. Conversely, islands of intact sagebrush and perennial grasslands surrounded by degraded lands support limited wildlife and species richness. Focusing on the restoration of sagebrush steppe would increase structural diversity for sagebrush-obligate wildlife over the long term. Improving riparian-wetland areas would have the same impacts as described under the previous section.

Climate change could also affect vegetation composition by shifting the timing, duration, and amount of precipitation; warmer and drier summer conditions could effectively facilitate increased wildland fire severity and frequency. Historically, moderate fire return intervals and low intensity fires allowed sagebrush to persist within recently burned areas and thus promoted the mixed composition of sagebrush communities. However, wildfires are becoming larger and more frequent and, with the invasion of noxious species, have increased the risk of the native plant community shifting to a community dominated by annual grasses and other exotic species. This shift in the vegetation community decreases habitat structure and function and provides unsuitable forage and cover conditions for many sagebrush-associated animal species [Ecoregional Assessment Program, 2013]; [Miller et al., 2011].

### ***Wildlife and Fish Resource Management Actions***

Scheduling small-scale construction and routine maintenance activities to avoid or minimize disturbance to priority species and their habitat during important seasonal periods would reduce disturbance of priority species during crucial periods and could benefit other wildlife species using these areas. Impacts to other wildlife species resulting from potentially disruptive activities would be addressed during project-specific NEPA compliance through the implementation of timing stipulations and spatial buffers, such as those described in the *Seasonal Wildlife Restrictions and Procedures for Processing Request for Exceptions on Public Lands in Idaho* [USDI BLM, 2010], the *Draft Guidelines for Raptor Conservation in the Western United States* [Whittington & Allen, 2008], and the ID/SW MT Greater Sage-Grouse Amendment.

### ***Livestock Grazing Management Actions***

Livestock grazing could result in direct competition with wildlife for forage, water, and space. Wildlife disturbance or displacement could also result from the construction and maintenance of range improvements. At unsustainable levels of grazing, impacts can lead to loss of vegetative cover, reduced water infiltration rates, decreased plant litter, increased bare ground, reduced nutrient cycling, decreased water quality, increased soil erosion, increased transport and establishment of weeds, and reduced overall habitat quality for wildlife and fish. Habitat destruction would be greatest in areas of livestock concentration, especially when resources are most susceptible to damage (i.e., saturated soils). For example, livestock tend to concentrate in riparian-wetland areas important to wildlife and fish, which can result in impacts to the quality and quantity of vegetation available for security cover, forage, and stream shading.

Sustainable management of livestock grazing, including deferring grazing on pastures, resting pastures, and monitoring forage utilization would likely avoid or minimize adverse impacts to wildlife and fish resources. Management of BLM-administered lands to meet both habitat objectives for sage-grouse and Standards would result in actions that would balance the impacts of grazing while sustaining wildlife species and their habitat. For example, the development of livestock grazing strategies, such as emphasizing utilization on non-native seedlings, would provide an opportunity to improve or maintain native range conditions that support a diversity of wildlife species.

Research suggests that moderate or less livestock grazing ( $\leq 60\%$  utilization) occurring from mid-summer through winter is generally compatible with the maintenance of perennial grasses and forbs in sagebrush communities [Crawford et al., 2004]. If carefully monitored, conservative livestock use during the spring and early summer also may align with DFCs for wildlife, by providing sufficient residual cover for sage-grouse as well as making forbs more accessible to sage-grouse in grazed areas [Crawford et al., 2004]. However, at higher levels of grazing, trampling and defoliation of palatable vegetation species could have short- and long-term impacts on upland vegetation by reducing plant vigor and reproduction, thereby limiting resources available to wildlife and the capacity of existing perennial communities to reestablish [Anderson & Holte, 1981]. In general, as the number of AUMs increases, the amount of residual herbaceous cover would be reduced because of increased consumption and trampling by livestock. If grazing occurs during the late- or post-growing season (i.e., summer - winter), less vegetation would be available for wintering wildlife and for security cover for nesting birds prior to new growth the following spring. Livestock use occurring in the early spring would also result in a reduction of the residual herbaceous understory from the previous year's growth. Inadequate security cover could lead to increased predation and lower nesting success for upland nesting birds such as sage-grouse, sage thrasher, and Brewer's sparrow [Connelly et al., 2004]; [Braun, 2006].

Livestock may disturb nests and burrows used by wildlife. Although a relatively small portion of bird nests are actually trampled by livestock [Renfrew & Ribic, 2003], the effects may be additive to other forms of nest failure [Renfrew, Ribic, & Nack, 2005]. Livestock are known to flush birds from nests [Coates, 2007], which could increase detection of nests by avian predators. Livestock may also trample burrows used by wildlife such as pygmy rabbits, ground squirrels, burrowing owls, and tiger beetles. Grazed sites with sandier soils are more likely to have burrows collapsed by livestock than pastures with loamy soils [Holmes, Green, Morgan, & Livezey, 2003].

While there would be adverse impacts to some wildlife species from livestock grazing, there would also be beneficial impacts to other species. For example, grazing can improve nesting habitat for long-billed curlew and horned larks by reducing the height of vegetation. Livestock grazing can also enhance forage and habitat conditions for wildlife by increasing the palatability of

forage. A number of research studies have shown the nutritional quality of shrubs [Alpe, Kingery, & Mosley, 1999] and grass [Pitt, 1986]; [Westenskow-Wall, Krueger, Bryant, & Thomas, 1994] was improved for a period of time by livestock grazing on winter range. Periodic (once every three to five years) moderate spring grazing by livestock was reported to promote the establishment of desired shrubs for browse [Austin, 2000] by reducing grass competition to shrub seedlings and increasing shrub canopy [Ganskopp, Svejcar, Taylor, Farstvedt, & Paintner, 1999]. In addition, light to moderate grazing in dense, grassy meadows during late spring and early summer can stimulate the regrowth of forbs, thereby inducing use by sage-grouse [Beck & Mitchell, 2000].

Livestock grazing practices also impact specific species in difference ways. Cattle diets overlap to a high degree with those of elk, and domestic sheep diets have a high overlap with pronghorn and mule deer diets, potentially creating year-round competition for forage between livestock and big game species. When cattle are removed during winter months from elk crucial winter range, it eliminates most of the potential competition between these two species; however, moderate summer grazing by cattle may also improve forage conditions for elk during critical periods (i.e., winter and early spring) [USDI, 2006]. Similarly, winter use by domestic sheep can cause competition with mule deer and pronghorn on their respective winter ranges, but summer and fall cattle use of grasses balances wildlife use on pronghorn and mule deer winter range by maintaining a more diverse and healthy mixture of grasses and shrubs in these habitats.

Domestic sheep pose risk of disease transmission to bighorn sheep; contact between species can result in mortality to bighorn sheep individuals and reduce long-term herd health. “Disease, primarily bacterial pneumonia, has played a uniquely important role in the dynamics of bighorn sheep populations and has been responsible for numerous bighorn sheep population declines throughout North America [Cassirer & Sinclair, 2007]”. To inform the potential for Risk of Contact, the Risk of Contact Tool was utilized for the Lost River PMU/CHHR. Based on this analysis two allotments (Craters and Quaking Aspen) were identified to occur within 22 miles of the Lost River PMU/CHHR. The Annual Risk of Contact projections for the Craters allotment was zero for both summer use (May to October) and winter use (November to April) by domestic sheep. The Annual Risk of Contact for Quaking Aspen Allotment was virtually zero for both summer and winter use. Risk of contact assumes domestic sheep presence. However, these allotments are currently grazed by cattle. As such, the risk of contact is currently zero. The Risk of Contact was analyzed because conversions from cattle to sheep are permitted. The Risk of Contact is common to all alternatives, except for Alternative D. The Risk of Contact for Alternative D is zero because it does not authorize livestock grazing within the Monument.

**Table 4.3. Annual Risk of Contact (ROC) projections for Monument allotments within 22 Miles of the Lost River PMU/CHHR. These projections assume the presence of domestic sheep.**

Allotment	Summer ROC	Winter ROC
Craters	0.0%	0.0%
Quaking Aspen	0.1%	0.4%

Although the Risk of Contact Tool was not relied upon to inform the Risk of Contact relative to the Pioneer PMU, the Risk of Contact is expected to be low. This is concluded because the Pioneer PMU does not contain a persistent presence of bighorn sheep. The lack of a persistent bighorn sheep population would reduce the likelihood that bighorn sheep would occur in proximity to the Monument. Moreover, the majority of the Monument is not characterized as preferred bighorn sheep habitat. Bighorn sheep are known to inhabit steep, rocky, and mountainous terrain. The Monument is predominately open and characterized by reduced topographic variation. Suitable

habitat in vicinity of the Monument is almost exclusively restricted to the Pioneer Mountains. Only a very small portion of the Monument overlaps the foothills of the Pioneer Mountains. Of note, the majority of this portion of the Monument is administered by the NPS, which does not permit grazing.

Range improvements, such as fencing and water developments, are designed to assist in the management of livestock grazing distribution and use patterns, but could impact wildlife in various ways. Fences can benefit wildlife habitat by controlling or eliminating livestock grazing in areas important to wildlife, resulting in increased vegetative cover and forage availability. However, existing fences, particularly those that do not conform to BLM standards for fence construction, create travel barriers, alter distribution patterns, increase stress and energy loss, and cause injury or death to big game from entanglement. Fences become a larger concern during periods of deep snow and late in the winter season when animal body condition is poor. Fences also create hazards for low-flying birds and provide perches for avian predators. Mortality could be mitigated for some species by marking the top wire of the fence [Stevens et al., 2012] and utilizing perch deterrents. New fences constructed to BLM standards would present similar hazards to wildlife, but to a lesser degree. The indirect beneficial impact of fences is the control of appropriate levels and durations of livestock grazing, which improves health, vigor, cover, and production of vegetation important to wildlife and fish.

Water developments can benefit wildlife such as bats, migratory birds, and big game by providing additional watering areas in arid habitats [Taylor & Tuttle, 2007]. Development of offsite water also allows streams and other water sources to be fenced out, thereby maintaining higher-quality riparian areas for wildlife. Water developments provide the opportunity to defer or rest certain habitats from livestock grazing to improve vegetative values and can alter grazing distribution to increase cover in areas that previously received high utilization levels, which would beneficially impact wildlife and fish and their habitats.

However, creating additional water sources expands livestock use to new areas. Areas that receive less livestock use are often favored by wildlife due to ample forage and cover, reduced competition for resources, and limited human disturbance associated with grazing management activities [Hosten, Whitridge, & Broyles, 2007]. Increased grazing use in the immediate vicinity of new water developments can degrade the value of these habitats by removing vegetation, altering plant community structure and composition [NMVLWG, 2011], trampling ground-nesting birds or small mammals, and displacing wildlife. The development of springs and other water sources to support livestock can also reroute the natural flow of water [NMVLWG, 2011], resulting in a decrease in the extent of riparian-wetland areas. Water developments pose a drowning hazard to wildlife [NMVLWG, 2011] and may produce mosquitoes that carry the West Nile virus. West Nile virus could be lethal to crows, eagles, gulls, hawks, jays, owls, ravens, sage-grouse, and a variety of songbirds in the planning area [Marra et al., 2004].

Predicted climate change effects on local precipitation and temperature may also increase the occurrence of insect outbreaks and diseases such as West Nile virus [Ecoregional Assessment Program, 2013]. The risk of West Nile virus is expected to increase as temperatures increase and is likely related to the amount of surface water associated with irrigated agriculture, as well as livestock tanks and ponds that contain shallow water and emergent vegetation [Ecoregional Assessment Program, 2013].

#### **4.2.4.4. Discussion of Impacts by Alternative**

##### **Wildlife and Fish, including Special Status Species: Alternative A**

###### ***Water Resources Management Actions***

Alternative A manages riparian-wetland areas to maintain or achieve PFC, which would beneficially impact wildlife resources over the long term. Healthy riparian areas improve aquatic habitat, which provides foraging opportunities for wildlife that prey on aquatic vertebrates and invertebrates.

The BLM utilizes sustainable management practices and various site-specific actions to move areas toward PFC. Management actions may include water developments in upland habitats to draw grazing animals away from riparian-wetland areas, exclusionary fences to eliminate use by livestock, and frequent herding of livestock away from riparian-wetland areas. These actions are anticipated to ultimately result in a riparian-wetland system with increased vegetation and structural diversity, leading to an increase in abundance and diversity of wildlife and fish. Although this management would likely improve habitat, because the PFC assessment methodology does not directly incorporate the habitat requirements of wildlife and fish, additional management might be necessary to ensure the habitats provide conditions suitable to meet the life-history requirements of various species. Specifically, management practices that achieve Standards 2, 4, and 8 would help to fulfill the habitat requirements of numerous wildlife and fish species.

If livestock grazing use reached total allowable permitted levels, maintaining and/or improving streams and springs to PFC would likely require additional site-specific management to achieve DFCs as compared to the current situation. For example, riparian fencing could be implemented to protect or restore the natural function of riparian areas. Additional fence would be a minor source of mortality for some wildlife, primarily birds, and could restrict access by some species of wildlife to riparian-wetland habitats.

###### ***Vegetation Resources Management Actions***

Alternative A manages sagebrush steppe communities to prevent loss of shrub cover and promotes a diverse, desirable grass and forb understory. It also seeks to restore annual grasslands and highly degraded sagebrush steppe communities to achieve a mosaic of shrubs, forbs, and grasses capable of sustaining native wildlife. Management of BLM-administered lands to meet Standards would result in actions that would provide an appropriate mix of grass, forb, and shrub species composition and structure that would provide forage, security, and thermal cover needed for wildlife resources. This would result in minor to moderate, long-term, beneficial effects for numerous BLM sensitive species, including many species of migratory birds.

If livestock grazing use reached total allowable permitted levels, maintaining and/or improving sagebrush steppe communities to Standards would likely require additional structural improvements (e.g., pipelines and water troughs) to achieve DFCs as compared to the current situation. Increased grazing use in the immediate vicinity of new developments could degrade the value of these habitats for wildlife.

###### ***Wildlife and Fish Resource Management Actions***

Under all alternatives, seasonal restrictions for small-scale construction and routine maintenance activities would be applied to avoid or minimize disturbance to priority species and their habitat. Seasonally restricting disturbance activities in these areas would reduce harassment of priority species during crucial periods and could benefit other wildlife species. Impacts to other wildlife species resulting from potentially disruptive activities would be addressed during project-specific NEPA through the implementation of timing stipulations and spatial buffers. Important wildlife periods include winter for most wildlife, spring for nesting birds and birthing for big game, and early summer for some songbirds.

### ***Livestock Grazing Management Actions***

Alternative A allows livestock grazing on 273,900 acres of BLM-administered lands in the planning area. It does not allow livestock grazing on 1,200 acres. Lands open to grazing could reduce habitat quality for some species of wildlife, depending on grazing management, the grazing season of use, plant utilization levels, and the kinds and amounts of infrastructure built or maintained to facilitate grazing. However, all AMPs, detailing the management of livestock on portions of the Monument, would be subject to NEPA review and analysis; therefore, impacts of grazing can be expected to be minimal due to the application of sustainable grazing management. There would be no direct competition for forage, water, or space between livestock and wildlife on closed lands, which would beneficially impact wildlife.

Wildlife habitat available or unavailable (closed) to livestock grazing for each of the alternatives is described in Table 4.4, “Acres of Wildlife Habitat Available to Livestock Grazing on BLM-Administered Lands in the Monument.”. Fish habitat does not occur on BLM-administered lands available to livestock grazing in the Monument; therefore, no impacts to fish would occur under this alternative. However, fish that occupy streams in allotments that span the Monument boundary could be indirectly affected by management actions that restrict livestock grazing within the planning area.

**Table 4.4. Acres of Wildlife Habitat Available to Livestock Grazing on BLM-Administered Lands in the Monument.**

<b>Wildlife Habitat</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>	<b>Alternative E</b>
Shrubland	76,500 (99%) <sup>1</sup>	62,500 (81%)	76,500 (99%)	0	75,500 (98%)
Grassland	195,600 (>99%)	189,900 (97%)	195,500 (>99%)	0	195,500 (>99%)
Deciduous Woodland	100 (100%)	100 (100%)	100 (100%)	0	100 (100%)
Other <sup>2</sup>	1,700 (93%)	1,600 (87%)	1,700 (93%)	0	1,700 (93%)
Total	273,900 (>99%)	254,100 (92%)	273,600 (>99%)	0	272,800 (>99%)
Sage-grouse Breeding	211,700 (>99%)	192,000 (90%)	211,400 (>99%)	0	210,600 (>99%)
Sage-grouse Summer	248,100 (>99%)	228,300 (92%)	247,800 (>99%)	0	247,000 (>99%)

Wildlife Habitat	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Sage-grouse Winter	203,200 (>99%)	184,000 (90%)	202,900 (>99%)	0	202,100 (>99%)
Elk Winter	77,300 (>99%)	77,300 (>99%)	77,300 (>99%)	0	77,300 (>99%)
Mule Deer Winter	91,900 (>99%)	91,900 (>99%)	91,900 (>99%)	0	91,900 (>99%)
Pronghorn Winter	89,200 (100%)	89,100 (>99%)	89,200 (100%)	0	89,100 (>99%)
Total Big Game Winter	107,000 (>99%)	106,800 (>99%)	107,000 (>99%)	0	106,800 (>99%)

### Note

**1** Percentages represent the percentage of wildlife habitat within the Monument that is available to livestock grazing.

**2** Other includes sparse vegetation, agriculture, and developed vegetation types.

Livestock grazing would continue to be managed through existing grazing plans and would be modified as necessary to meet Standards, which includes maintaining healthy, productive, and diverse populations of native plants and animals. National and state drought policies (e.g., *BLM Instruction Memorandum No. 2013-094: Resource Management During Drought*; [USDI BLM, 2013]) are in place and would be followed to minimize impacts on rangelands under drought conditions. Continuation of these drought policies would not specifically protect wildlife habitat, although the policies could provide indirect benefits through more conservative use of sagebrush steppe habitat.

Livestock forage utilization levels would be established on a case-by-case basis under Alternative A, which typically manages forage use to not exceed moderate utilization of key forage species. In areas where utilization levels are excessive (> 60%), such as near water troughs and sheep bed grounds, adverse effects on wildlife resulting from competition for forage would be long-term. Areas of high plant use could adversely impact the success of many species of ground-nesting birds by reducing plant density and the standing height needed to effectively conceal nests from predators [Connelly, Schroeder, Sands, & Braun, 2000], although some grassland bird species would benefit from the increased availability of shorter-grass areas. High utilization levels in riparian-wetland habitats would reduce available forage and cover for wildlife and aquatic resources and could cause a decline in plant diversity, which could result in a decline in the number of species the area can support.

In the areas available to livestock grazing, Alternative A has no restrictions regarding seasons of use. Livestock grazing that predominantly occurs during spring, summer, and fall would limit direct spatial impacts to wintering big game and sage-grouse. Sage-grouse and other upland wildlife would primarily be affected by livestock grazing activities during the spring and early summer. Livestock use could result in trampling of ground nests or dislodge some eggs or nests in low shrubs; as stated above, this is rare. However, the presence of livestock would increase the likelihood of sage-grouse abandoning their nests [Crawford et al., 2004]. Birds that lose or

abandon nests early in the breeding season may renest. However, renesting is less likely later in the breeding season (late June).

Livestock also many incidentally trample and collapse burrows used by wildlife such as pygmy rabbits, burrowing owls, and invertebrates. In particular, Idaho dunes tiger beetle larvae could be crushed by livestock during the spring (April-June) when instars are more likely to occupy shallow burrows. However, livestock use simultaneously ensures that sand dunes remain active by reducing encroaching vegetation, thereby providing habitat for the species to persist [Bauer, 1991]; [Idaho State Conservation Effort, 1996].

Sheep use of playas as watering areas can impact species like pronghorn that could use the water during fawning (spring and early summer). Although the water associated with playas would dry up naturally each year, it would be available for longer periods without the sheep use. Activities related to sheep herding (the presence of humans and dogs) would temporarily displace wildlife during the spring and fall.

Livestock grazing managed for light to moderate utilization and authorized outside of sensitive periods such as nesting and fawning/calving would likely reduce or eliminate potential conflicts and be the most beneficial for wildlife and their habitats [Beck & Mitchell, 2000], [Crawford et al., 2004]. Special status wildlife, such as sage-grouse, would benefit where grazing management considers habitat needs. Although little direct experimental evidence links grazing practices to population levels of sage-grouse [Connelly & Braun, 1997], the impacts of livestock grazing on sage-grouse habitat have been studied. Several authors have noted that unsustainable grazing by livestock could reduce the suitability of breeding and brood-rearing habitat, adversely affecting sage-grouse populations [Dobkin, 1995]; [Connelly & Braun, 1997]; [Beck & Mitchell, 2000]. For example, the reduction of grass heights due to livestock grazing in sage-grouse nesting and brood-rearing areas has been shown to negatively affect nesting success when herbaceous height is reduced below 7 inches [Gregg, Crawford, Drut, & DeLong, 1994], and a reduced availability of forbs resulting from heavy sheep use during the spring and early summer can affect the reproductive success of sage-grouse [Barnett & Crawford, 1994]. However, Aldridge et al. (2008) did not find any relationship between sage-grouse persistence and livestock densities, likely because livestock numbers do not necessarily correlate with range condition. It was found that the intensity, duration, and distribution of livestock grazing are more influential on rangeland condition than the livestock density values used in their modeling efforts [Aldridge et al., 2008].

Range improvements can also change livestock grazing patterns and alter the way wildlife use their habitats. Alternative A allows range improvements on a case-by-case basis, and it is expected that new projects to improve livestock distribution (e.g., fences, pipelines, ponds, and water troughs) would continue to a degree throughout the majority of the planning area and would be subject to site specific NEPA review. In order for range improvements to be approved (and for the impacts described below to occur), this NEPA review would need to determine that the project presented no significant impacts (EA) or that the impacts were outweighed by the benefits (EIS). Existing livestock developments could be removed if they are no longer serving a useful purpose or if resource objectives warrant their removal. New developments would not be permitted in the North Pasture of Laidlaw Park Allotment and Bowl Crater Allotment unless they result in a net benefit to those resources identified as needing improvement or protection. Depending on the project and location, wildlife habitat could be reduced or divided at the local scale.

New fences could add to the 68 miles of existing fence on BLM-administered lands in the Monument, increasing the potential for collisions by special status birds and possibly leading



to altered movement patterns of big game traveling to and from seasonal or foraging habitats. However, fences control livestock movements allowing a larger number of pastures to remain ungrazed during nesting, which partially mitigates impacts to nesting birds at the planning area scale.

New water developments associated with livestock grazing might also affect wildlife. Water developments provide the opportunity to defer or rest certain habitats from livestock grazing to improve vegetative values and can alter grazing distribution to increase cover in areas that previously received high utilization levels. Development of offsite water also allows springs and other water sources to be fenced out, thereby maintaining higher-quality riparian-wetland areas for wildlife. However, new water developments constructed in sage-grouse nesting habitat would likely reduce hiding cover by facilitating increased harvest of standing grasses that shield nesting sage-grouse and young chicks. If proper design features are not incorporated, the development of water sources to support livestock also can have the secondary effect of changing the habitat present at the water source before diversion. This impact could result in the loss or reduction of riparian or wet meadow habitat important to wildlife as sources of forbs or insects. Water developments for livestock could be used as mosquito breeding habitat if shallow water and emergent vegetation are present, and thus have the potential to facilitate the spread of West Nile virus.

The average number of AUMs used by livestock has been significantly below authorized use over the last 15 years (average 31% of permitted use levels). If livestock grazing use reached total allowable permitted levels, failure to implement appropriate livestock grazing management could degrade habitat for numerous sensitive species. Maintaining and/or improving wildlife habitats to meet Standards would require additional site-specific management to achieve DFCs as compared to the current situation. Additional structural improvements such as fences, pipelines, and troughs would likely be implemented to distribute livestock use. When livestock developments encourage use in areas previously not used or rarely used by livestock, effects on native wildlife, including but not limited to sage-grouse, can be expected. Impacts would take the form of increased disturbance, loss of forage, and loss of hiding cover. However, the utilization of all permitted AUMs could also increase the amount of shorter-grass areas used by ground-foraging bird species and locally improve nesting habitat for species such as long-billed curlew.

## **Wildlife and Fish, including Special Status Species: Alternative B**

### ***Water Resources Management Actions***

Alternative B manages riparian-wetland areas to maintain or achieve PFC but strives to attain reference state vegetation in riparian-wetland areas relative to the NRCS ESD. Unlike Alternative A, which relies on managing for Standards and site-specific actions to maintain and/or achieve PFC, Alternative B focuses on using the natural restorative capacity of sites and reduced levels of livestock grazing to improve riparian-wetland areas. Riparian fencing could be implemented to achieve DFCs if found to result in a net benefit to wildlife.

PFC is a minimal requirement for meeting the habitat requirements of wildlife; however, this minimum is not the same as late-successional riparian-wetland communities. The establishment of willows or other woody plants would provide long-term structure for nesting, foraging, and cover for wildlife using riparian areas. Increases in the quantity and quality of herbaceous riparian-wetland vegetation and insects would also have beneficial impacts on special status wildlife species, and sage-grouse in particular.

### ***Vegetation Resources Management Actions***

Similar to all alternatives, Alternative B manages to maintain or achieve Standards. In addition, Alternative B prioritizes adjusting livestock grazing systems to focus livestock use on non-native perennial grass seedings. Focusing grazing on non-native perennial grass seedings could provide greater benefits to wildlife utilizing intact native sagebrush habitats. Focusing grazing on non-native perennial grass seedings would increase the availability of forage and cover in intact native sagebrush habitats. However, wildlife use of non-native seedings does occur, including use by sage-grouse. Over the short term, this management action could result in adverse impacts to wildlife species that use the seeded communities occurring across approximately 104,000 acres of the planning area. For example, habitats north of the Wapi Lava Flow currently provide important year-round habitat for sage-grouse. Increased livestock use in these areas would decrease the residual cover available for nesting and brood-rearing activities and could alter the insect prey base [Rambo & Faeth, 1999] used by birds, lizards, and some small mammals. Conversely, the higher utilization in the seeded communities could increase the amount of shorter-grass areas used by ground-foraging bird species and locally improve nesting habitat for species such as long-billed curlew. Over the long term, however, the percentage cover of sagebrush in the seeded areas would likely increase [Pellant & Lysne, 2005], benefitting numerous sagebrush-obligate species that utilize these areas, including sage-grouse.

### ***Wildlife and Fish Resource Management Actions***

Impacts on wildlife and fish resources from scheduling small-scale construction and routine maintenance activities to avoid or minimize disturbance to priority species and their habitat during important seasonal periods are expected to be the same as discussed for Alternative A. Alternative B does provide for, during permit modification, the development of allotment specific habitat objectives for priority wildlife species. Allocating specific habitat objectives for priority species is expected to provide for beneficial impacts to priority species by promoting management practices that minimize conflicts and promote species conservation. The benefits from implementing habitat objectives during the permit renewal process would vary depending on the presence of species, availability of habitat, habitat quality, and other factors. However, it is expected that management objectives would seek to minimize conflicts and could provide for minor to moderate beneficial impacts.

### ***Livestock Grazing Management Actions***

Alternative B allows livestock grazing across approximately 254,100 acres of the planning area. Approximately 21,000 acres of the planning area would be unavailable to livestock grazing to benefit Monument values, including habitat for sensitive wildlife species such as sage-grouse. Shrubland habitats in the closed areas are used extensively for bird nesting and brood rearing, and removing livestock from these areas would minimize potential livestock-related impacts such as displacement and trampling and would result in greater amounts of residual upland cover both in the short and long terms. Closing these areas to livestock grazing would also reduce potential competition for forage, water, and space between livestock and big game. Depending on plant species' presence in the understory, native forbs and grasses could increase, and sites in poor ecological condition could recover. However, removing livestock grazing could also hasten habitat degradation if ungrazed fuel loads in communities comprised of dense sagebrush and an understory of annual grasses result in wildfires that burn uniformly and kill sagebrush over a large area [Crawford et al., 2004].

Reducing the stocking rate throughout the remainder of the planning area by 20% of the previous 15-year average of actual use would similarly decrease competition for forage and could enhance wintering habitat for big game and nesting habitat for many species of sagebrush-obligate wildlife across the remaining 254,100 acres of the planning area available to livestock grazing. In addition, wildlife and fish habitats outside the Monument could receive more or less livestock use as a result of the AUM reductions in the planning area. For example, perennial streams that provide habitat for sensitive fish species such as redband trout are present in BLM portions of grazing allotments that span the Monument boundary. Additional livestock use in these pastures would increase the potential for sedimentation, loss of streamside vegetation, and loss of water-holding capacity in these watersheds, thereby reducing habitat for several fish species.

Alternative B manages shrublands and grasslands for biological diversity and to benefit wildlife, consistent with meeting Standards. Allotments would be prioritized for retirement if grazing privileges are relinquished or if an allotment becomes vacant; RCAs would not be considered. Overall, Alternative B grazing management would result in greater long-term, beneficial impacts to wildlife than Alternative A.

Important habitats, such as lekking, nesting, and early brood-rearing areas (i.e., breeding habitat) occupied by sage-grouse (see Appendix G, *Greater Sage-Grouse Occupied Seasonal Habitat Methodology on Craters of the Moon BLM National Monument Lands*), outside of closed areas, would be seasonally protected through restrictions on 191,964 acres, which would minimize potential adverse impacts on sage-grouse and other sagebrush steppe wildlife during important life-cycle activities, notably breeding, nesting, and calving/fawning. Approximately 62,100 acres in the planning area would be open to livestock grazing with no seasonal restrictions, which could result in adverse effects to big game or several ground-nesting species in these areas. Effects to wildlife would be more likely to occur where concentrated livestock use results in heavy utilization of herbaceous species (i.e., perennial grasses and/or forbs) or disturbance to individual wildlife.

Management under Alternative B would restrict types of potential livestock grazing infrastructure. In the areas closed to livestock grazing, no new livestock developments would be permitted. Also, in areas closed to grazing all livestock developments (e.g., corrals, cattleguards, fences, tanks, troughs, pipelines, reservoirs/ponds, spring developments, wells) would be identified, analyzed, and prioritized for removal, consolidation, or modification to maintain and improve intact habitats.

In areas open to livestock grazing, Alternative B focuses on the use of livestock grazing management strategies that do not require additional water sources or fences to maintain, enhance, or achieve habitat objectives. No additional reservoirs, playas, wells, or springs would be developed during the lifetime of the MMP. Water developments can locally increase the amount of livestock presence and plant harvest; therefore, management that precludes new developments would locally benefit many species of wildlife that utilize these areas for foraging or nesting. Limiting range developments to maintain or improve intact habitat would beneficially impact wildlife resources. However, developments also provide the opportunity to defer or rest certain habitats from livestock grazing to improve vegetative values and can alter grazing distribution to increase cover in areas that previously received high utilization levels. The indirect beneficial impact of livestock developments is the control of appropriate levels and durations of livestock grazing, which improves health, vigor, cover, and production of vegetation important to wildlife and fish.

Compared with Alternative A, management under Alternative B would further reduce, but would not eliminate, impacts from livestock grazing activities on sensitive species, including sage

grouse and their habitat. Alternative B would provide long-term benefits to sage-grouse by increasing upland and riparian nesting and brood-rearing habitat amount and quality, and would decrease both short- and long-term impacts to the species by reducing livestock use of seasonal habitats. Also, it could remove certain developments in closed areas to maintain and improve intact habitat habitats. Beneficial impacts to other sagebrush-obligate wildlife would also likely be greater under Alternative B than Alternative A, because sage-grouse needs would be the focus for managing sagebrush steppe habitats [Dobkin, 1995].

## **Wildlife and Fish, including Special Status Species: Alternative C**

### ***Water Resources Management Actions***

Similar to Alternative A, Alternative C would beneficially impact wildlife resources over the long term by managing for PFC. However, maintaining and/or improving streams and springs to PFC would likely require additional site-specific management to achieve DFCs as compared to the current situation. If used, riparian fencing could be a minor source of mortality for some wildlife, primarily birds, and could restrict access of some species of wildlife to riparian-wetland habitats.

### ***Vegetation Resources Management Actions***

Impacts on wildlife are expected to be similar to Alternative B. However, additional management actions under Alternative C would consider directing grazing for sagebrush recovery and/or to benefit the diversity of seedings. Increased livestock use in seedings would result in short-term, adverse impacts to wildlife because the residual cover of existing perennial grasses would be reduced in localized areas. Livestock also may trample sagebrush seedlings, thereby removing a source of sage-grouse food and cover [Connelly et al., 2004]. However, over the long term, increases in sagebrush cover and/or forb abundance would improve habitat for sage-grouse, big game, and other species that use the seeded areas.

Alternative C would allow for implementation of up to 1,000 acres of ungrazed reference plots throughout the planning area. Temporary human presence during construction and monitoring would cause short-term disturbance to wildlife. However, depending on the size of the plots, wildlife that forage or nest in the enclosures could benefit over the long term from the lack of disturbance and competition for forage with livestock. The installation of additional fence in the planning area, which would be necessary for many of the plots, would reduce habitat quality in localized areas. Where possible, new fences would tie into existing fences on public land, which may reduce the amount of new fence construction.

### ***Wildlife and Fish Resource Management Actions***

Impacts on wildlife and fish resources are expected to be the same as discussed for Alternative A.

### ***Livestock Grazing Management Actions***

Under Alternative C, approximately the same number of acres would be available to livestock grazing as under Alternative A. Also, there would be little change to the total livestock forage allocation unless an allotment is retired from grazing, or site specific evaluations indicate the need. Authorized grazing could result in a reduction of forage and cover for wildlife, including numerous species of birds and big game.

Special status species habitat protection measures, primarily those for sage-grouse, would be more restrictive to livestock grazing than Alternative A, but would be less restrictive than Alternative B.

These restrictions would minimize adverse impacts on sagebrush-obligate wildlife from livestock management activities over an area that is smaller than what is proposed under Alternative B, but greater than Alternative A, and would provide a long-term benefit to wildlife in the planning area because management would be tailored to maintain or improve sagebrush habitats.

Alternative C manages shrublands and grasslands to meet Standards. Management would result in actions that could balance the impacts of grazing while sustaining wildlife and their habitat. LHAs would be prioritized consistent with the management actions identified in the ID/SW MT Sub Regional EIS, and implementation guidelines for livestock grazing management would be set based upon vegetation and wildlife habitat conditions. Specific objectives would be developed to maintain, enhance, or restore vegetation conditions relative to site potential. Livestock grazing would be used as a tool where needed to enhance sagebrush recovery and/or to benefit the diversity of non-native, seeded communities. Diverse plant communities would beneficially impact wildlife because each species has its own particular forage and cover requirements; generally, the more diverse the habitat, the more species of wildlife it can support.

If implemented, seasonal restrictions within sage-grouse breeding habitats would result in the same beneficial impacts to sage-grouse as described for Alternative B; however, implementation of the seasonal restrictions would likely not occur in every pasture within the seasonal habitats. The pastures that would be grazed during the breeding period would typically rotate annually. Where livestock grazing is adjusted or seasonally restricted to provide appropriate forage and cover in breeding areas, impacts of grazing on sage-grouse and other sagebrush-obligate wildlife would be locally reduced. However, this benefit may be offset if heavy livestock use occurs in the grazed pastures, especially since sage-grouse usually exhibit high site fidelity [Crawford et al., 2004].

Overall, Alternative C grazing management would likely result in greater short- and long-term beneficial impacts to wildlife than Alternative A, and fewer short- and long-term beneficial impacts than Alternatives B and D. Management actions relative to livestock grazing would be similar to those described for Alternative B; however, additional livestock management activities would be permitted that could adversely impact wildlife species and would result in a larger wildlife impact area. Livestock use in sensitive wildlife habitats could result in wildlife displacement, competition for forage, and loss of habitat around developments. Conducting LHAs, managing for sage-grouse and their habitats, would reduce impacts from grazing relative to alternative A. Implementing management that meets the habitat needs of sage-grouse would likewise improve conditions and strengthen management for most other sagebrush-obligate species [Dobkin, 1995]; [Hanser & Knick, 2011].

## **Wildlife and Fish, including Special Status Species: Alternative D**

### ***Water Resources Management Actions***

Similar to Alternative B, Alternative D strives to attain reference state vegetation in riparian-wetland areas. However, because no livestock grazing would occur on public lands, less fencing would be needed to meet the DFCs for riparian-wetland areas, which would result in greater beneficial impacts to wildlife.

### ***Vegetation Resources Management Actions***

Similar to Alternative A, Alternative D manages sagebrush steppe communities to prevent loss of shrub cover and promotes a diverse, desirable grass and forb understory. As outlined in the

2007 MMP, vegetation management would seek to restore annual grasslands and highly degraded sagebrush steppe communities to achieve a mosaic of shrubs, forbs, and grasses capable of sustaining native wildlife and fish.

### ***Wildlife and Fish Resource Management Actions***

Impacts on wildlife and fish resources are expected to be the same as discussed for Alternative A.

### ***Livestock Grazing Management Actions***

Under Alternative D, livestock use would be unavailable on approximately 275,100 acres for the life of the plan; no grazing would be authorized on public lands in the planning area. Infrastructure and disturbance attributed to livestock use and livestock management would be prioritized for removal, rehabilitation, or restoration except where required to keep livestock out of the planning area. Similar to Alternative B, wildlife and fish habitats outside the Monument could receive more or less livestock use as a result of the AUM reductions in the planning area.

Closing the planning area to livestock grazing would likely maintain or improve riparian-lentic habitats within the Monument by reducing vegetation use, bank erosion, sedimentation, and/or contaminants attributed to livestock use. Reducing adverse impacts attributed to livestock is expected to promote healthy riparian-wetlands. Healthier riparian-wetlands would improve aquatic habitat, which would provide enhanced foraging opportunities for wildlife that prey on aquatic vertebrates and invertebrates. In more arid regions of the Monument, the water quality of individual playas would likely improve due to the reduction of fecal deposition by livestock, benefitting numerous aquatic vertebrates and invertebrates and enhancing stopover habitat for migratory birds during the spring and fall. Wildlife such as pronghorn that utilize playas during fawning (spring and early summer) would benefit from the reduced competition with livestock.

Management under Alternative D would reduce impacts on sage-grouse and other sagebrush-associated wildlife compared to Alternative A and the remaining action alternatives. Sagebrush habitats in the Monument are used extensively for bird nesting and brood rearing during the spring and summer and provide critical forage and cover for sage-grouse during late fall and winter. Removing permitted grazing would minimize potential livestock-related impacts such as displacement of individual birds and trampling of nests and would result in greater amounts of residual upland cover both in the short and long terms. This alternative would also reduce potential competition for forage, water, and space between livestock and big game during critical periods such as winter as well as calving/fawning in the spring and early summer.

Closing Laidlaw Park to livestock grazing would similarly decrease competition with wildlife for forage, water, and space and could enhance breeding, nesting, and wintering habitats for numerous upland species (e.g., sage-grouse, migratory birds, and big game) occurring across 83,100 acres of the planning area. Specifically, 83,100 acres of occupied sage-grouse breeding habitat, 63,500 acres of occupied summer habitat, and 63,400 acres of occupied late fall-winter habitat would be protected from potential livestock-related impacts. This action could also result in greater amounts of residual upland cover and forbs for wildlife in the short and long terms, particularly in high-use areas such as near water troughs and sheep bed grounds.

Depending on plant species' presence in the understory, native forbs and grasses could increase. However, removing livestock grazing could hasten habitat degradation if ungrazed fuel loads in communities comprised of dense sagebrush and an understory of annual grasses result in wildfires that burn uniformly and kill sagebrush over a large area [Crawford et al., 2004]. A complete

grazing exclusion could also promote exotic annual grass invasion in some situations. Davies, Svejcar, and Bates (2009) determined that long-term grazing exclusion followed by fire typically resulted in exotic annual grass invasion, while fire following moderate levels of grazing did not promote invasion. Moderate grazing made the perennial herbaceous component of the sagebrush plant communities more tolerant of fire [Davies et al., 2009], perhaps due to a reduction in crown litter [Davies, Bates, Svejcar, & Boyd, 2010].

Management under this alternative would include removal of water developments, fences, and other range infrastructure that could contribute to wildlife mortality or locally modify habitat conditions. Removal of water troughs could decrease available source habitat for mosquitoes that could carry the West Nile virus and would make more water available on the ground for sage-grouse, their habitats, and other wildlife species. Removal of up to 65 miles of existing interior fence would reduce the potential of sage-grouse direct fence strikes as well as the number of perches for avian predators within these areas. Sage-grouse collision risk with fences was quantified using methodologies developed by Stevens and others (2012). Occupied leks from 2011 were used to inform risk of collision. Removal of existing interior fences would remove 33 miles of fence identified as a collision risk. Collision risk estimates for these 33 miles includes: 10.6 miles of high risk, 13.6 miles of moderate risk, and 9 miles of low risk.

Although interior fences would be removed, additional fence infrastructure could be necessary to separate federal no-grazing areas from other federal, private and state parcels with grazing. This could result in increased risk of sage-grouse strikes and big game entanglement along those boundaries. Where construction of new fences occurs within 1.25 miles of occupied sage-grouse leks or existing high-density fence areas, the fences would pose a collision risk for sage-grouse and would provide additional perches for avian predators. However, mitigating measures (e.g., marking fences and installing perch deterrents) could be utilized to reduce the incidence of sage-grouse mortality [Stevens et al., 2012]. Also, building fences consistent with suggested practices to minimize big game conflicts could minimize adverse consequences with entanglement of big game. This may include adjusting spacing between wires, using a minimum number of wires, adjusting fence height, utilizing smooth wire, utilizing drop-down fences, or increasing visibility.

One option to facilitate closing Monument lands to livestock grazing would be to fence existing cattle allotments along the boundary. Approximately 92 miles of perimeter fence would be required to accomplish this. This includes 43.6 miles of infrastructure that represents a collision risk to sage-grouse, including: 16 miles of high risk, 15.3 miles of moderate risk, and 12.3 miles of low risk. Developments related to State and private lands would remain. That portion of the Monument allocated to sheep would not be fenced, and would be signed for closure. Fences would not be constructed within sheep allotments because domestic sheep can be controlled with herders, thus reducing the need to construct fence in these portions of the Monument.

Alternately, if all cattle and sheep allotments within the Monument area are fenced along the boundary, approximately 162 miles of fence would be constructed. Constructing 162 miles of fence would result in an increase of approximately 70 miles of fence infrastructure relative to the option of only fencing cattle allotments. Fencing 162 miles of the monument boundary is estimated to include 67.5 miles of fence infrastructure that would represent an increased collision risk to sage-grouse, including: 25.8 miles of high risk, 25.7 miles of moderate risk, and 16 miles of low risk. Increasing fence infrastructure would increase the risk of collision for sage-grouse and entanglement of big game. Relative to other options, this option is expected to have the greatest consequences for priority species from conflicts with fence infrastructure.

If fencing the Monument boundary is not utilized to facilitate closing Monument lands to grazing then intensive livestock management practices or utilization of existing fence infrastructure adjoining the Monument boundary would be necessary to close Monument lands to livestock grazing. Intensive livestock management practices may include not utilizing water sources within one mile of the Monument boundary, as well as placing salt and other minerals supplements away from the Monument boundary. Existing infrastructure would be the nearest adjacent pasture or allotment boundary fence adjoining the Monument. Utilizing existing fence infrastructure would result in an additional closure of approximately 92,000 acres of land outside the Monument boundary. Either of these options would result in a decrease in fence infrastructure, due to the removal of 65 miles of interior fence. Removal of existing interior fences would remove 33 miles of fence identified as a collision risk to sage-grouse, including 10.6 miles of high risk, 13.6 miles of moderate risk, and 9 miles of low risk. Decreasing fence infrastructure would decrease the risk of collision with sage-grouse, entanglement with big game, and decrease potential perch sites for avian predators.

The final extent of fence necessary to implement no grazing in the Monument would be determined during implementation of this MMP Amendment.

## **Wildlife and Fish, including Special Status Species: Alternative E**

### ***Water Resources Management Actions***

Impacts are expected to be the same as discussed for Alternative C.

### ***Vegetation Resources Management Actions***

Impacts are expected to be the same as discussed for Alternative C.

### ***Wildlife and Fish Resource Management Actions***

Impacts on wildlife and fish resources are expected to be the same as discussed for Alternative A.

### ***Livestock Grazing Management Actions***

Alternative E allows livestock grazing across approximately 272,800 acres (99%) of the planning area. Approximately 2,200 acres of the planning area would be unavailable. Closing these areas to livestock grazing would reduce potential competition for forage, water, and space between livestock and priority species. Depending on plant species' presence in the understory of areas closed to grazing, native forbs and grasses could increase, and sites in poor ecological condition could recover. However, removing livestock grazing could also hasten habitat degradation if ungrazed fuel loads in communities comprised of dense sagebrush and an understory of annual grasses result in wildfires that burn uniformly and kill sagebrush over a large area [Crawford et al., 2004].

Reducing the stocking rate throughout the remainder of the planning area by 51% of total permitted AUMs would similarly decrease competition for forage and could enhance wintering habitat for big game and nesting habitat for many species of sagebrush-obligate wildlife across the remaining 272,800 acres of the planning area available to livestock grazing. In addition, wildlife and fish habitats outside the Monument could receive more or less livestock use as a result of the AUM reductions in the planning area. For example, perennial streams that provide habitat for sensitive fish species such as redband trout are present in BLM portions of grazing allotments that span the Monument boundary. Additional livestock use in these pastures would increase the



potential for sedimentation, loss of streamside vegetation, and loss of water-holding capacity in these watersheds, thereby reducing habitat for several fish species.

Important habitats, such as lekking, nesting, and early brood-rearing areas (i.e., breeding habitat) occupied by sage-grouse (see Appendix G, *Greater Sage-Grouse Occupied Seasonal Habitat Methodology on Craters of the Moon BLM National Monument Lands*), outside of closed areas, could be seasonally protected through restrictions on livestock grazing if implemented. Deferment of grazing in these habitat types during the early brood rearing season would minimize potential adverse impacts on sage-grouse and other sagebrush steppe wildlife during important life-cycle activities, notably breeding, nesting, and calving/fawning. Effects to wildlife would be more likely to occur where concentrated livestock use results in heavy utilization of herbaceous species (i.e., perennial grasses and/or forbs) or disturbance to individual wildlife.

Compared with Alternatives A and C, management under Alternative E would further reduce, but would not eliminate, impacts from livestock grazing activities on sensitive species, including sage grouse and their habitat. Relative to Alternative B, Alternative E is expected to have slightly more adverse impacts, because it allocates more AUMs and acreage available to grazing. Regardless, Alternative E is expected to provide long-term benefits to sage-grouse by increasing upland and riparian nesting and brood-rearing habitat amount and quality, and potentially would decrease both short and long-term impacts to the species by reducing livestock use of seasonal habitats. Alternative E is expected to result in similar benefits to Alternative B, because the benefits of reducing herbaceous matter consumption are similar, just at reduced level relative to Alternative B. Beneficial impacts to other sagebrush-obligate wildlife would also likely be greater under Alternative E, because Alternative E would reduce herbaceous matter consumption by reducing permitted AUMs. Decreasing herbaceous matter consumption would be expected to increase cover and forage for priority species, resulting in long term beneficial impacts.

## **4.2.5. Native American Rights and Interests**

Federal agencies are required to take into account the effects of their actions on Native American values, such as tribal treaty rights/trust resources, ethnographic resources, access to traditional use areas and/or religious/sacred sites, preservation of archaeological sites, the handling of Native American Graves Protection and Repatriation Act (NAGPRA) materials, and the maintenance of suitable habitat for subsistence species of importance to Tribes.

### **4.2.5.1. Summary**

All alternatives would meet the DFCs for Native American Rights and Interests outlined in the 2007 MMP and protect traditional tribal relationships with the land.

Alternative A would have a moderate effect on maintaining the long-term integrity of the majority of ethnographic and cultural resources within the Monument by continuing to emphasize aggressive range restoration. Short-term, minor to moderate impacts could occur from vehicle traffic, initial restoration activities, wildfire and suppression activities, and livestock grazing. Alternative C would have the same impacts as Alternative A.

Alternatives B and E would have a moderate effect on maintaining the long-term integrity of the majority of ethnographic and cultural resources within the Monument by reducing the number of permitted livestock AUMs, livestock-related developments, and removing a substantial number of

acres from livestock grazing. Short-term, site-specific, negligible to minor impacts could still occur from the remaining livestock grazing activities.

Alternative D would have the same moderate effect on ethnographic and cultural resources as Alternative B, without the potential for any impacts from livestock grazing. The natural reclamation of some roads may have a site-specific, long-term, minor to moderate impact on Tribal access under Alternative D, but could be mitigated through consultation with Tribes.

#### **4.2.5.2. Assumptions**

In order to analyze the effects of the plan alternatives on Native American values, several meetings were held with interested Tribal staff to collect their comments on the alternatives. Analysis indicators used to identify impacts to Native American Rights and Interests are associated with the number of acres available for livestock grazing and the amount of permitted AUMs, by alternative. Certain assumptions were made regarding Native American values within the Monument. These assumptions include:

- Section 106 archaeological inventory would be conducted for all proposed development projects as required by the NHPA under each of these alternatives. The agencies would undertake Tribal consultation if any proposed development was determined to have adverse impacts to cultural resources or Native American values.
- Tribes regulate their own members' hunting on the Preserve and the BLM areas of the Monument.
- BLM and NPS staff would continue to meet with interested Tribal staff on a regular basis to discuss and address issues of concern as they arise.
- The current road network provides sufficient access to traditional use areas for Tribal members.
- The handling of NAGPRA materials would follow the guidance provided in the law and would not vary by alternative.

#### **4.2.5.3. How Activities Affect Native American Rights and Interests**

##### ***Water Resources Management Actions***

The development of springs and ponds before the passage of FLPMA and NEPA have damaged cultural resources in the past. Removing these facilities and recontouring the ground surface would not necessarily mitigate those past impacts, due to the nature of cultural resource deposits. Once disturbed, subsurface cultural deposits cannot be recreated. Section 106 inventory and Tribal consultation would be used to avoid any additional impacts to cultural/ethnographic resources that may be present in these areas.

##### ***Vegetation Resources Management Actions***

The occurrence of Tribal Rights and Interests does not measurably differ between native vegetation areas and non-native, seeded areas. Therefore, directed grazing could potentially increase livestock-related impacts in seeded areas, while reducing impacts to native vegetation areas. The level of impact would be dependent upon the number of AUMs authorized and the number of acres available for grazing. The season of use could also have a bearing on the level

of impact. Cultural resource site monitoring would identify areas of highest impact and steps could be taken to mitigate those impacts where found. Native plants and sagebrush obligates, such as sage-grouse, are of high value to Tribes. Any action that would impact those resources will be of concern to Tribes.

### ***Livestock Grazing Management Actions***

Several activities typically associated with livestock grazing have the potential to impact ethnographic/cultural resources, native plants, and sagebrush-obligate species. (See Section 4.2.4, “Wildlife and Fish, Including Special Status Species” for a description of how livestock grazing impacts sagebrush obligates.) Facility construction, maintenance, and/or removal can impact cultural and ethnographic sites by moving soil, destroying subsurface cultural resources deposits, and damaging native plant communities. These implementation-level impacts are generally mitigated by the NEPA and the NHPA Idaho State Protocol Agreement (SPA) (2014).

Livestock, whether cattle or sheep, can also impact cultural and ethnographic resources in a number of ways [Osborn, Vetter, Hartley, & Brown, 1987]; [Wildesen, 1982]. Typically, one animal on the surface of a site does negligible damage to subsurface deposits. The number of animals present and the amount of surface use/disturbance can vary widely across an allotment. Many impacts can be short or long term and minor to major in effect, but tend to be very site-specific in nature. Animals can potentially move or break surface artifacts by hoof action, but the uppermost layers of archaeological sites are generally assumed to be disturbed levels by professional archaeologists. Cultural resource damage occurs most often when livestock pressure is so concentrated that the uppermost level of a site is eroded away and deeper deposits below 4 in. (10 cm) are exposed. This effect can be most readily observed at livestock watering locations where animals tend to congregate for long periods of time. The weight of the livestock and the season of use also have a bearing on the type/degree of impact. Sheep, even in large numbers, are typically moved often and have less long-term impacts than cattle, especially when soils are wet. Native plant communities can sustain similar impacts in areas of concentrated livestock use. Much of this impact is normally mitigated through the procedures outlined in NHPA and SPA.

Livestock are also known to rub on cultural resources such as historic structures and rock art boulders, especially in sheltered areas where they might congregate. There are relatively few standing historic structures within the Monument and no livestock-accessible rock art sites. Therefore, potential impacts from livestock rubbing on cultural resources within the Monument are rare.

A certain amount of vehicle traffic is also associated with livestock management activities, including four-wheel drive trucks and ATVs. Depending upon the time of year this traffic occurs, vehicles can potentially exacerbate erosion of roads if they are wet, damaging any cultural resources that may happen to lie within road routes. Such impacts could be short or long term and minor to major in degree, but are typically site-specific in nature.

### **4.2.5.4. Discussion of Impacts by Alternative**

#### **Native American Rights and Interests: Alternative A**

#### ***Water Resources Management Actions***

Direction under the 2007 MMP allows for playa restoration. Any such restoration would be subject to SPA and Section 106 inventory and potential impacts to any cultural resources sites

would be mitigated. Therefore, impacts to cultural and ethnographic resources would be negligible from the actual restoration. Reducing the number of livestock attracted to those natural water sources would have long-term, site-specific effects on soil stability, wildlife, and native plants.

### ***Vegetation Resources Management Actions***

Under Alternative A, sagebrush steppe restoration efforts would continue. This can involve the use of prescribed fire and drill seeding to return the vegetation to a mix of perennial plants and shrubs. Any fire, wild or prescribed, exposes cultural resources on the ground surface, placing them at risk for unauthorized collection and increased soil erosion. Any restoration projects would be subject to SPA and Section 106 inventory as they arise to assure cultural resources are not impacted. Flagging cultural resources for avoidance often attracts attention to those sites and increases the risk of unauthorized collection. Sagebrush steppe restoration activities would have a short-term, minor to possibly moderate effect on cultural resources. However, the long-term stabilization of the soils, the return of native plant communities, and the reduced potential for future wildfires would have a long-term, moderate effect on Native American Rights and Interests.

### ***Livestock Grazing Management Actions***

In Alternative A, livestock grazing continues at the current level of 38,187 AUMs permitted on 273,900 acres of land available for grazing. Actual use levels over the last 15 years average about 11,791 AUMs per year. This alternative has the most acres available for livestock grazing of the five, with only 1,200 acres unavailable for grazing. Any new livestock water facilities are restricted to the Passage Zone (Figure 2.3, “Craters of the Moon National Monument and Preserve Management Zones”), although few new developments are anticipated and none have been installed since the 2007 MMP was signed. Since livestock tend to congregate around water sources, there could be long-term, site-specific, minor to moderate impacts to cultural and ethnographic resources located near water sources. Following the procedures in Appendix H of the SPA could mitigate these impacts.

## **Native American Rights and Interests: Alternative B**

### ***Water Resources Management Actions***

Increased emphasis on restoring all riparian areas to PFC and striving to reach reference state under Alternative B would have a long-term, site-specific effect to Native American Rights and Interests by reducing the number of livestock attracted to those natural water sources as described in Ch. 3 Water Resources and the potential for livestock-related impacts.

### ***Vegetation Resources Management Actions***

Under Alternative B, sagebrush steppe restoration efforts would continue. The only change in vegetation management would be the direction of prioritizing grazing on non-native perennial seedings rather than native vegetation. This action could potentially increase livestock activity on cultural or ethnographic resources in those areas. Livestock congregation around water sources and at corrals can cause soil disturbance and erosion, subsequently destabilizing cultural resource site surfaces. However, the reduced number of AUMs permitted in this alternative makes this unlikely. There would be a long-term, site-specific, negligible to minor impact to Native American Rights and Interests in non-native seeded areas.

### ***Livestock Grazing Management Actions***

In Alternative B, livestock grazing management would change dramatically. The level of permitted AUMs would be reduced to 9,432 AUMs permitted on 254,100 acres of land available for grazing. There would be a reduction of 21,000 acres available for grazing by closing Little Park kipuka, the North Pasture of Laidlaw Park Allotment, the North Pasture of Bowl Crater Allotment, Park Field kipuka, a portion of the Craters Allotment, and Larkspur Park kipuka. No new water facilities would be permitted in the closed areas and existing facilities would be identified for removal, consolidation, or modification to maintain and improve intact habitats if warranted. Removal of livestock grazing and the supporting infrastructure from some areas would result in reduced opportunity for livestock trampling on native plant communities and cultural resources, thereby reducing the potential for soil erosion and increasing surface stability of sites. These management actions would create a long-term, moderate effect to Native American Rights and Interests in the areas excluded from grazing.

Any new livestock water facilities are restricted to the Passage Zone (Figure 2.3, “Craters of the Moon National Monument and Preserve Management Zones”), although few new developments are anticipated and none have been installed since the 2007 MMP was signed. Any new salt, mineral supplements, troughs, reservoirs, and holding facilities would be placed more than 200 meters from lava edges and playas, minimizing the likelihood of livestock congregation on cultural and ethnographic resources.

Livestock congregation tends to create long-term, site-specific, minor to moderate impacts to plant communities and cultural resources located near water sources. However, this alternative would evaluate existing water developments and corrals to identify any conflicts with cultural resources, and prioritize them for removal or modification. No new spring developments or water pipelines would be allowed in areas closed to grazing. Such measures would create a long-term, minor to moderate effect on cultural resource site surface stability.

For the purpose of protecting sage-grouse in Alternative B, no spring or early summer livestock grazing would be allowed in nesting or early brood-rearing habitats. This exclusion of spring grazing may improve soil stabilization by avoiding livestock traffic over wet soils, and thus improving cultural resource site stabilization and native plant communities in those areas. Some trailing and vehicle activity could still occur across closed public lands because the State and private lands could still be grazed in the spring. Overall, there would be a long-term, moderate effect on cultural and ethnographic site surface stability. The removal of livestock from some areas of the Monument may result in a long-term improvement to wildlife species of Tribal interest in those closed areas.

The design and/or removal of structural range improvements to benefit sage-grouse would have a negligible impact to cultural resources, as any new project would be subject to NEPA review and inventory. This action could have a long-term, site-specific, negligible to minor impact to Native American Rights and Interests.

## **Native American Rights and Interests: Alternative C**

### ***Water Resources Management Actions***

The impacts to Native American Rights and Interests from riparian restoration under this alternative would be the same as Alternative A.

### ***Vegetation Resources Management Actions***

Impacts to cultural and ethnographic resources by potentially directing grazing for sagebrush recovery under Alternative C are very similar to the impacts under Alternative A, due to the similar number of permitted AUMs. There would be long-term, negligible to minor impacts to Native American Rights and Interests.

### ***Livestock Grazing Management Actions***

New restrictions on livestock grazing to ease impacts to sage-grouse would also indirectly lower impacts to cultural and ethnographic resources by adjusting season of use, level of use, and grazing schedules in areas not meeting Standards and by turning off water troughs in lekking areas during breeding season to avoid attracting livestock. Alternative C would have a long-term, negligible to minor effect to Native American Rights and Interests.

### **Native American Rights and Interests: Alternative D**

#### ***Water Resources Management Actions***

The impacts to Native American Rights and Interests from riparian restoration under this alternative would be the same as Alternative B.

#### ***Vegetation Resources Management Actions***

Impacts to Native American Rights and Interests from vegetation management under this alternative would be the same as Alternative A. Even without the presence of livestock grazing, the effects of wildfires, fire suppression activities, and restorations would continue as under Alternative A.

#### ***Livestock Grazing Management Actions***

Any fence or facility removal, as well as new fence construction, would be subject to NEPA and cultural resource inventory and any sites would be mitigated. Therefore, impacts to cultural and ethnographic resources would be negligible from these activities. The removal of livestock Monument-wide would provide for long-term, moderately increased levels of protection for plant and wildlife species of Tribal interest.

There would be no spring grazing during sage-grouse breeding season authorized under Alternative D. The exclusion of livestock grazing and associated vehicle activity during the wetter, spring season would result in less potential soil erosion to roads, as well as less soil erosion due to hoof action of the livestock themselves. Less soil erosion indirectly benefits cultural resources and native vegetation in all areas of the Monument by stabilizing soils. Some trailing and vehicle activity could still occur across public lands because State and private lands could still be grazed in the spring. Overall, there would be a long-term, moderate impact to Native American Rights and Interests.

Under this alternative, there would be no winter grazing permitted. Wintering wildlife species of interest to Tribes in the Monument would not experience any conflicts with livestock. Native plants would be dormant. Soils are usually frozen during most of the winter season, so potential for soil erosion is low that time of year. The exclusion of livestock grazing during the winter season would have a negligible to minor impact to native plants and cultural/ethnographic resources.

Alternative D closes all of the Monument, including the Laidlaw Park kipuka, to livestock grazing year round. Such a closure would greatly reduce the potential for livestock/wildlife species

of concern to Tribes conflicts, livestock congregation on cultural resource sites, and impacts to native vegetation on public lands within Laidlaw Park. However, State and private lands within Laidlaw Park would continue to be grazed, so a certain amount of livestock-associated vehicle traffic and livestock trailing would still occur across public lands. With regards to Native American Rights and Interests, there would be a minor to moderate impact to wildlife, native plants, and site surface stability within Laidlaw Park were it to be closed to livestock grazing year round. The same is true for the entire Monument.

Some roads may be naturally reclaimed from less livestock management-related travel, which may indirectly help stabilize native plant communities and cultural resource site surfaces that happen to lie within road prisms. Reduced numbers of access routes could potentially prevent Tribal members from accessing some areas with motorized vehicles, but this could be mitigated through Tribal consultation where necessary. There would be a long-term, minor to moderate impact to Native American Rights and Interests in those instances.

### **Native American Rights and Interests: Alternative E**

#### ***Water Resources Management Actions***

The impacts to Native American Rights and Interests from riparian restoration under this alternative would be the same as Alternative A and C.

#### ***Vegetation Resources Management Actions***

Impacts to cultural and ethnographic resources by potentially directing grazing for sagebrush recovery under Alternative E are very similar to the impacts under Alternative C. As with Alternative B, the reduced level of authorized AUMs in this alternative makes the impacts of directing grazing toward non-native perennial seedings less likely to result in livestock congregation and soil destabilization. There would be a long term, site-specific, negligible to minor impact to Native American Rights and Interests.

#### ***Livestock Grazing Management Actions***

New restrictions on the amount of disturbance allowed from livestock-related infrastructure or developments would indirectly lower impacts to cultural and ethnographic resources as well. Alternative E would have a long-term, negligible to minor effect to Native American Rights and Interests.

## **4.2.6. Cultural Resources**

To date, there are over 500 recorded cultural resources within the planning area on BLM land, consisting of a variety of Native American use areas and livestock-related, Euro-American sites. Sources of impacts to cultural resources are surface-disturbing activities which may result from wildfires and suppression activities, vegetation restoration, livestock grazing, and vehicle traffic. Natural deterioration is continually impacting cultural resources as well, due to the continual accretion and deflation of desert soils.

### **4.2.6.1. Summary**

All alternatives would meet the DFCs for cultural resources outlined in the 2007 MMP and preserve the traditional, historical relationships with the land, with the exception of Alternative D.

Because of the location and current condition of the NPS Study Trail Goodale's Cutoff, none of the alternatives would result in measurable impacts to the trail.

Alternative A would have a moderate effect on maintaining the long-term integrity of the majority of archaeological resources within the Monument by continuing to emphasize range restoration. Short-term, minor to moderate impacts could occur from vehicle traffic, initial restoration activities, wildfire and suppression activities, and livestock grazing. Alternative C would have the same impacts as Alternative A.

Alternative B and E would have a moderate effect on maintaining the long-term integrity of the majority of archaeological resources within the Monument by reducing the number of permitted livestock AUMs, livestock related developments, and removing a substantial number of acres from livestock grazing. Short-term, site-specific, negligible to minor impacts could still occur from the remaining livestock grazing activities.

Alternative D would have the same moderate effect on cultural resources as Alternative B, without the potential for any impacts from livestock grazing.

#### **4.2.6.2. Assumptions**

In order to analyze effects of the plan alternatives on cultural resources, all available information regarding known archaeological sites was compiled. Map locations of cultural resources were compared with locations of the acres available for livestock grazing for each alternative. Analysis indicators used to identify cultural resource impacts are associated with the number of acres available for livestock grazing and the amount of permitted AUMs, by alternative. Certain assumptions were made regarding management of cultural resources in the future. These assumptions include:

- Some proactive Section 110 inventory (i.e. non-project related inventory) will be completed within the Monument each year.
- Inventory will be conducted for all proposed development or restoration projects and for grazing permit renewals as required by FLPMA, NHPA, and SPA under each of these alternatives.
- NRHP listed and eligible sites, including the NPS Study Trail Goodale's Cutoff, will be monitored for vandalism and other impacts and protected/stabilized as necessary.
- Wildfires will continue to occur and range restoration will be performed for most burned areas using Section 106 to mitigate impacts to cultural resources and the NPS Study Trail Goodale's Cutoff.
- None of the management actions in the Alternatives would substantially interfere or be incompatible with the nature and purposes of the National Study Trail, including the resources, qualities, values or associated settings or the primary use or uses.

#### **4.2.6.3. How Activities Affect Cultural Resources**

##### ***Water Resource Management Actions***

The excavation of ponds in playas prior to the passage of FLMPA and NEPA have damaged cultural resources in the past. Removing these facilities and recontouring the ground surface



would not necessarily mitigate those past impacts, due to the nature of cultural resource deposits. Once disturbed, subsurface cultural deposits cannot be recreated. SPA/Section 106 inventory and Tribal consultation would be used to avoid any additional impacts to cultural resources that may be present in these areas.

### ***Vegetation Resources Management Actions***

The occurrence of cultural resources does not measurably differ between native vegetation areas and non-native, seeded areas. Therefore, directing grazing could potentially increase livestock related impacts to sites in seeded areas, while reducing impacts to sites in native vegetation areas. The level of impact would be dependent upon the number of AUMs authorized and the number of acres available for grazing. The season of use could also have a bearing on the level of impact. Cultural resource site monitoring would identify areas of highest impact and steps could be taken to mitigate those impacts where found.

### ***Livestock Grazing Management Actions***

Several activities typically associated with livestock grazing have the potential to impact cultural resources. Facility construction, maintenance, and/or removal can impact sites by moving soil and destroying subsurface cultural resources deposits. These impacts would be mitigated by the Section 106 process.

Livestock, whether cattle or sheep, can also impact cultural resources in a number of ways [Osborn et. al.,1987]; [Wildesen, 1982]. Typically, one animal on the surface of a site does negligible damage to subsurface deposits. The number of animals present and the amount of surface use/disturbance can vary widely across an allotment. Many impacts can be short or long term and minor to major in effect, but are typically site-specific in nature. Animals can potentially move or break surface artifacts by hoof action, but the uppermost layers of archaeological sites are generally assumed to be disturbed levels that lack integrity by professional archaeologists. Cultural resource damage occurs most often when livestock pressure is so concentrated that the uppermost level of a site is eroded away and deeper deposits below 4 in. (10 cm) are exposed. This effect can be most readily observed at livestock watering locations where animals tend to congregate for long periods of time. The weight of the livestock and the season of use also have a bearing on the type/degree of impact. Sheep, even in large numbers, are typically moved often and have less long-term impact than cattle, especially when soils are wet.

Livestock are also known to rub on cultural resources such as historic structures and rock art boulders, especially in sheltered areas where they might congregate. There are relatively few standing historic structures within the Monument and no livestock-accessible rock art sites. Therefore, potential impacts from livestock rubbing on cultural resources within the Monument are rare.

A certain amount of vehicle traffic is also associated with livestock management activities, including four-wheel drive trucks and ATVs. Depending upon the time of year this traffic occurs, vehicles can potentially exacerbate erosion of roads if they are wet, damaging any cultural resources that may happen to lie within the road bed. Such impacts can be short or long term and minor to major in effect, but typically site-specific in nature.

## **4.2.6.4. Discussion of Impacts by Alternative**

### **Cultural Resources: Alternative A**

### ***Water Resources Management Actions***

Direction under the 2007 MMP allows for playa restoration. Any such restoration would be subject to NEPA review and cultural resource inventory, and any cultural sites would be mitigated. Therefore, impacts to cultural resources would be negligible from the actual restoration. There would be long-term, site-specific effects to cultural resources by reducing the number of livestock attracted to those natural water sources, which would allow site surfaces to stabilize.

### ***Vegetation Resources Management Actions***

Under Alternative A, sagebrush steppe restoration efforts would continue. This involves the use of prescribed fire and drill seeding to return the vegetation to a mix of perennial plants and shrubs. Any fire, wild or prescribed, exposes cultural resources on the ground surface, placing them at risk for unauthorized collection and increased soil erosion. Any restoration projects would be subject to Section 106 inventory to assure cultural resources are not impacted. Flagging cultural resources for avoidance often attracts attention to those sites and increases the risk of unauthorized collection. Sagebrush steppe restoration activities would have a short-term, minor to possibly moderate impact on cultural resources and soil stability. However, long-term stabilization of the soils and the reduced potential for wildfire would result in a long-term, moderate effect to cultural resources.

### ***Livestock Grazing Management Actions***

In Alternative A, livestock grazing continues at the current level of 38,187 AUMs permitted on 273,900 acres of land available for grazing. Actual use levels over the last 15 years average about 11,791 AUMs per year. This alternative has the most acres available for livestock grazing of the four, with only 1,200 acres unavailable for grazing. Any new livestock water facilities are restricted to the Passage Zone (Figure 2.3, “Craters of the Moon National Monument and Preserve Management Zones”), although few new developments are anticipated and none have been installed since the 2007 MMP was signed. Since livestock tend to congregate around water sources, there could be long-term, site-specific, minor to moderate impacts to any cultural resources located near existing water sources, but those impacts would be mitigated by following the procedures outlined in the SPA.

## **Cultural Resources: Alternative B**

### ***Water Resources Management Actions***

Increased emphasis on restoring all riparian areas to PFC and striving to reach reference state under Alternative B would have a long-term, site-specific effect on any cultural resources in riparian areas by reducing the number of livestock that have access to those natural water sources and improving site surface stability.

### ***Vegetation Resources Management Actions***

Under Alternative B, sagebrush steppe restoration efforts would continue. The only change in vegetation management would be the direction of prioritizing grazing on non-native perennial seedings. This action could potentially increase livestock activity on cultural resources in non-native seeded areas. Likewise, livestock congregation around water sources and at corrals can cause soil disturbance and erosion, subsequently destabilizing cultural resource site surfaces if they occur there. However, the reduced number of AUMs permitted in this alternative makes

this unlikely. There would be a long-term, site-specific, negligible to minor impact to cultural resources in non-native seeded areas.

### ***Livestock Grazing Management Actions***

In Alternative B, livestock grazing management would change dramatically. The level of permitted AUMs would be reduced to a total of 9,432 AUMs on 254,100 acres of land available for grazing. A reduction of 21,000 acres available for grazing would close Little Park kipuka, the North Pasture of Laidlaw Park Allotment, the North Pasture of Bowl Crater Allotment, Park Field kipuka, Larkspur Park kipuka, and a portion of Craters Allotment to grazing. No new water facilities would be permitted in the closed areas and existing facilities there would be identified for removal, consolidation, or modification to maintain and improve intact habitats if warranted. Removal of livestock grazing and the supporting infrastructure from some areas would result in reduced opportunity for livestock trampling on cultural resources, thereby reducing the potential for soil erosion and increasing soil stability of sites. Some trailing and vehicle activity could still occur across closed public lands because State and private lands would remain open for grazing. These management actions would create a long-term, moderate effect to cultural resources in the areas excluded from grazing.

Any new livestock water facilities are restricted to the Passage Zone, although few new developments are anticipated and none have been installed since the 2007 MMP was signed. Any new salt, mineral supplements, troughs, reservoirs, and holding facilities would be placed more than 200 meters from lava edges and playas, minimizing the likelihood of livestock congregation on cultural resources.

Livestock congregation can create long-term, site-specific, minor to major impacts to cultural resources located near water sources. However, this alternative would evaluate existing water developments and corrals to identify any conflicts with cultural resources, and prioritize them for removal or modification. No new spring developments or water pipelines would be allowed. Such measures would create a long-term, minor to moderate effect to cultural resource site stability.

For the purpose of protecting sage-grouse, no spring or early summer livestock grazing would be allowed in nesting or early brood-rearing habitats. Exclusion of spring grazing in Alternative B may improve soil stabilization by avoiding vehicle and livestock traffic over wet soils, and thus improve archaeological site stabilization in those areas. This would have a long-term, moderate effect on cultural resource site stability.

The relocation or removal of structural range improvements to benefit cultural resources would have a negligible to minor, short term impact to cultural resources, as any new project would be subject to NEPA review and cultural resource inventory to avoid sites.

### **Cultural Resources: Alternative C**

#### ***Water Resources Management Actions***

The impacts to cultural resources from riparian restoration under this alternative would be the same as Alternative A.

#### ***Vegetation Resources Management Actions***

Impacts to cultural resources by potentially focusing grazing for sagebrush recovery under Alternative C are very similar to the impacts under Alternative A, due to the similar amount of permitted AUMs. There would be long-term, negligible to minor impacts to cultural resources.

### ***Livestock Grazing Management Actions***

New restrictions on livestock grazing to reduce impacts to sage-grouse would also indirectly lessen impacts to cultural resources by adjusting season of use, level of use, and grazing schedules in areas not meeting Standards and by turning off water troughs in lekking areas during breeding season to avoid attracting livestock. This action would have a long-term, negligible to minor effect on cultural resources. The relocation or removal of structural range improvements to benefit cultural resources would have a negligible to minor, short term impact to cultural resources, as any new project would be subject to NEPA review and cultural resource inventory to avoid sites.

### **Cultural Resources: Alternative D**

#### ***Water Resources Management Actions***

The impacts to cultural resources from riparian restoration under this alternative would be the same as Alternative B.

#### ***Vegetation Resources Management Actions***

Impacts to cultural resources from vegetation management under this alternative would be the same as Alternative A. Even without the presence of livestock grazing impacts, wildfires, fire suppression activities, and restorations would continue as under Alternative A.

#### ***Livestock Grazing Management Actions***

Any fence or facility removal, as well as new fence construction, would be subject to inventory and any sites would be mitigated. Therefore, impacts to cultural resources would be negligible from these activities.

Some roads may be naturally reclaimed from less livestock management-related travel, which may indirectly stabilize site surfaces that happen to lie within road prisms (the area consisting of road surfaces and any cut slope and road fill).

Under this Alternative, there would be no spring grazing during sage-grouse breeding season. The exclusion of livestock grazing and associated vehicle activity during the wetter, spring season would result in less potential soil erosion to roads, as well as less soil erosion due to hoof action of the livestock themselves. Less soil erosion indirectly benefits cultural resources in all areas of the Monument by stabilizing subsurface cultural resource deposits. Some trailing and vehicle activity could still occur across public lands because State and private lands could still be grazed in the spring. There would be a long-term, moderate impact to cultural resources.

Under this Alternative, there would be no livestock grazing during the wintering sage-grouse season either. Soils are usually frozen during most of the winter season, so potential for soil erosion is low that time of year. The exclusion of livestock grazing during the winter season would have a negligible to minor impact to cultural resources.

Laidlaw Park kipuka would be closed to livestock grazing year round. Such a closure would greatly reduce the potential for livestock congregation on cultural resource sites on public lands in Laidlaw Park. However, State and private lands within Laidlaw Park could continue to be grazed,

so a certain amount of livestock-associated vehicle traffic and livestock trailing could still occur across public lands. With regards to cultural resources, there would be a minor to moderate impact to site surface stability within Laidlaw Park were it to be closed to livestock grazing year round. The same is true of closing all Monument lands to grazing.

### **Cultural Resources: Alternative E**

#### ***Water Resources Management Actions***

The impacts to cultural resources from riparian restoration under this alternative would be the same as Alternatives A and C.

#### ***Vegetation Resources Management Actions***

Impacts to cultural resources by potentially directing grazing for sagebrush recovery under Alternative E are very similar to the impacts under Alternative C. As with Alternative B, the reduced level of authorized AUMs in this alternative makes the impacts of directing grazing toward non-native perennial seedings less likely to result in livestock congregation and soil destabilization. There would be a long term, site-specific, negligible to minor impact to cultural resources in non-native seeded areas.

#### ***Livestock Grazing Management Actions***

New restrictions on the amount of disturbance allowed from livestock-related infrastructure or developments and a reduced level of AUMs permitted would indirectly lower impacts to cultural resources as well. Alternative E would have a long-term, negligible to minor effect to cultural resources.

## **4.2.7. Visual Resources**

The region of influence used for the visual resource analysis is the planning area. Indicators used for analysis are the assigned visual resource management classes and how proposed management actions comply with those class objectives.

According to the Visual Resource Inventory Manual H-8410-1, “the assignment of visual management classes is ultimately based on the management decisions made in RMPs. However, visual values must be considered throughout the RMP process. All actions proposed during the RMP process that would result in surface disturbances must consider the importance of the visual values and the impacts the project may have on these values. Management decisions in the RMP must reflect the value of visual resources.” [H-8410-1, p. 6]

### **4.2.7.1. Summary**

No management actions are proposed for visual resources in this plan.

The visual resource contrast rating system is a systematic process used by the BLM to analyze potential visual impacts, or contrasts, of proposed projects and activities. It should be used as a guide to ensure that every attempt is made to minimize potential visual impacts. The Visual Resource Contrast Rating Manual H-8431-1 indicates that the degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The contrast can be measured by comparing the project

features with the major features in the existing landscape (landform/water, vegetation, and structures). The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the project. The Visual Resource Contrast Rating Manual provides guidelines for obtaining project descriptions and design techniques for mitigating visual impacts in order to meet management class objectives.

All actions proposed in Alternatives A through E would be subject to a Visual Resource Contrast Rating and would have to comply with assigned visual resource management class objectives that are designated in the current MMP.

#### **4.2.7.2. Assumptions**

- While VRM inventories may include all land jurisdictions and ownerships, BLM visual management decisions would only apply to BLM-managed lands.

#### **4.2.7.3. How Activities Affect Visual Resources**

##### ***Livestock Grazing Management Actions***

Depending on utilization levels and the density and visibility of range improvements, livestock grazing can have various degrees of impacts to visual resources.

#### **4.2.7.4. Discussion of Impacts by Alternative**

##### **Visual Resources: Alternative A**

##### ***Livestock Grazing Management Actions***

Livestock-grazing management would continue to comply with designated visual resource management classes within the Monument, resulting in negligible impacts to visual resources.

##### **Visual Resources: Alternative B**

##### ***Livestock Grazing Management Actions***

Livestock-grazing management would continue to comply with designated visual resource management classes within the Monument. Reductions in grazing would result in a minor short-term reduction in contrasts to the natural landscape due to fewer visible livestock during periods of grazing. This would cause minor beneficial impacts to visual resources.

##### **Visual Resources: Alternative C**

##### ***Livestock Grazing Management Actions***

Livestock-grazing management would continue to comply with designated visual resource management classes within the Monument, resulting in negligible impacts to visual resources.

##### **Visual Resources: Alternative D**

##### ***Livestock Grazing Management Actions***

The removal of livestock grazing in the Monument, including Laidlaw Park, would result in impacts, or contrasts, to the existing landscape features (land/water, vegetation, and structures) in the Monument. Changes in the elements (texture, color, line, and form) of the landscape features could occur. The short-term, direct impacts would occur as range improvements are removed and disturbed areas are rehabilitated. In the long term, direct impacts would occur as all disturbed areas from grazing operations are restored to reflect the natural landscape. This would result in moderate beneficial impacts to visual resources.

In areas where new fencing would be needed to exclude livestock grazing from the Monument, short-term impacts to the natural landscape would occur as areas of disturbance are created associated with fence installation. Long term impacts to the natural landscape would also occur due to new fences visually contrasting with the surrounding landscape. This would result in minor negative impacts to visual resources.

### **Visual Resources: Alternative E**

#### ***Livestock Grazing Management Actions***

Livestock-grazing management would continue to comply with designated visual resource management classes within the Monument, resulting in negligible impacts to visual resources.

## **4.2.8. Wilderness Study Areas**

The BLM's management policy is to continue resource uses on lands designated as WSAs in a manner that maintains the area's suitability for preservation as wilderness.

The wilderness characteristics of each WSA were reviewed and compared to each alternative. Based on past actions and current actions in the project area, predictions were made on the short- and long-term impacts to the WSA resources. When applicable, the WSA locations were compared to the locations of proposed actions and if there were potential impacts, they were analyzed.

### **4.2.8.1. Summary**

No management actions are proposed in this MMP Amendment for WSAs.

Under Alternatives A, B, C and E, livestock grazing would still be present. Depending on how WSA lands are utilized by grazing, impacts would differ between alternatives. Under Alternative A, the overall impacts to WSAs would be negligible to moderate. Under Alternative B, the overall impacts to WSAs would be negligible to moderate. Under the Alternative C, the overall impacts to WSAs would be minor to moderate. Under Alternative E, the overall impacts to WSAs would be negligible to moderate. Please note that any moderate impacts under Alternatives A, B, C, and E would be very site specific and occur in localized locations associated with livestock improvements.

Under Alternative D, WSAs would not be impacted from livestock operations. Although livestock grazing is allowed in WSAs, the complete removal of livestock and associated infrastructure would have an overall enhancement to wilderness characteristics in WSAs.

#### **4.2.8.2. Assumptions**

- Management decisions would not be proposed that would affect Congress's ability to make a wilderness determination for Raven's Eye, Great Rift, Bear Den Butte, and Little Deer WSAs.
- Management activities would comply with BLM's current policy on WSA management.

#### **4.2.8.3. How Activities Affect Wilderness Study Areas**

##### ***Water Resources Management Actions***

Restoring riparian areas to PFC and removing any signs of human development would enhance the naturalness characteristics of WSAs.

##### ***Vegetation Resources Management Actions***

Directing grazing to utilize non-native perennial seedings and to help recovery of sagebrush and seeding diversity would enhance the naturalness of WSAs. These non-native perennial seedings are sometimes visible as rows and are a human-caused impact.

##### ***Wildlife and Fish Resources Management Actions***

The presence of wildlife in WSAs are considered to be a supplemental value to the wilderness characteristics. Wildlife actions taken to benefit wildlife would comply with the non-impairment mandate to reduce human impacts.

##### ***Livestock Grazing Management Actions***

Livestock grazing can impact the naturalness, opportunities for solitude, and primitive and unconfined recreation of wilderness study areas. Where livestock congregate, impacts to the vegetation can be noticeable. The presence of livestock and related infrastructure are noticeable by visitors and can impact solitude. Motorized vehicle use associated with livestock operations can spread noxious weeds and invasive plant species from infested areas into currently un-infested areas, altering natural conditions.

#### **4.2.8.4. Discussion of Impacts by Alternative**

##### **Wilderness Study Areas: Alternative A**

##### ***Wildlife and Fish Resources Management Actions***

Small-scale construction activities and routine maintenance activities to avoid or minimize disturbance to priority species and their habitat during important seasonal periods would have a negligible impact to wilderness characteristics within WSAs. The impacts would be reductions in naturalness from human activity and developments. According to BLM Manual 6330, management actions taken to support wildlife management, whether proposed by the State or the BLM, must conform to the non-impairment mandate, as detailed in 1.6.C of Manual 6330. For all actions, the BLM will ensure that the non-impairment criteria are met, or that one of the exceptions to non-impairment applies. (see section 1.6.C of Manual 6330). These impacts would be the same for all alternatives.

##### ***Livestock Grazing Management Actions***



As indicated in the 2007 MMP analysis, livestock use affects wilderness characteristics in WSAs by altering natural animal and plant communities. These characteristics are also affected by the continued maintenance of and motor vehicle access to range improvements (such as fences and watering sites). Wildlife populations and distribution are altered when livestock compete with native wildlife for forage. The effects vary, since livestock do not use the WSA lands uniformly. The presence of temporary roads and livestock developments would not disqualify the area from potential legislative designation as wilderness. Any removal of infrastructure within WSAs would have a direct minor impact by enhancing the naturalness, opportunities for solitude, and unconfined recreation of those areas. Livestock use is authorized only on the WSA lands administered by BLM (16% of the total WSA acreage). Even within that 16%, the use of the lands by livestock is not uniform.

Vegetation in sheep bed grounds can be substantially altered by repeated annual use, but many areas near the edge of the lava field are grazed only lightly, if at all. Therefore, the effects would vary from negligible to moderate, depending on location. Most effects would be short-term, but potential changes to sagebrush steppe plant and animal communities through the spread of exotic annual grasses would be long-term and difficult to reverse.

Overall, the effect of livestock use on naturalness, opportunities for solitude, and unconfined recreation in WSAs could be moderate in some local areas where livestock concentrate, and the vegetative structure would be altered for long periods of time (5+ years). Because there would be no major impacts on the WSA resource, the wilderness values contained in the Monument's WSAs would not be impaired.

## **Wilderness Study Areas: Alternative B**

### ***Water Resources Management Actions***

Restoration of riparian areas within WSAs would enhance naturalness by creating a more natural appearance and helping re-establish native species. This would be a direct long-term minor impact. The impact would be the same for Alternatives C and D.

### ***Vegetation Resources Management Actions***

Grazing focused on non-native seeded areas that may occur within WSAs, could have short-term, minor impacts by the decrease in vegetation and concentration of cattle in those areas. However, there could be long-term minor to moderate enhancements to wilderness values, depending on success of the re-establishment of diverse, native vegetation.

### ***Livestock Grazing Management Actions***

In this alternative, the impacts from grazing would be similar to Alternative A; however, with a reduction in livestock grazing of 20% from average actual use, the intensity of impacts to WSAs could be reduced, depending on how WSA lands are used. In the six areas where livestock grazing would be completely removed (Little Park kipuka, North Pasture of Laidlaw Park Allotment, Larkspur Park kipuka, North Pasture of Bowl Crater Allotment, part of the Craters Allotment, and Park Field kipuka) there would be a long-term moderate enhancement to naturalness and opportunities for solitude. These areas either lie within the boundaries of WSAs or portions of them are designated WSA. Approximately half of Little Park kipuka lies within either the Little Deer WSA or the Great Rift WSA. The northern portion of the North Pasture of Laidlaw Park lies within the Great Rift WSA. Larkspur Park kipuka lies entirely in the Great Rift WSA. The

North Pasture of Bowl Crater Allotment lies entirely in the Great Rift WSA. Only a very small portion of the Park Field kipuka lies within the Great Rift WSA.

If an allotment containing WSA is retired there would be a direct long-term moderate enhancements to wilderness values in those areas.

#### **Wilderness Study Areas: Alternative C**

##### ***Vegetation Resources Management Actions***

Grazing focused on non-native seeded areas that may occur within WSAs, could have short-term, minor impacts from the decrease in vegetation and concentration of cattle in those specific areas. However, there could be long-term minor to moderate enhancements to wilderness values, depending on success of the re-establishment of diverse, native vegetation. Where fences are constructed for reference areas within or adjacent to WSAs, there would be impacts to the wilderness characteristics from fencing and the possible differences in vegetation utilization resulting from reference area implementation. These impacts would be direct, minor, short-term impacts for the duration of the reference areas and once the restoration area is removed.

##### ***Livestock Grazing Management Actions***

Overall, the changes in grazing between Alternative A and Alternative C would not result in any measurable differences in impacts to WSAs and their suitability.

#### **Wilderness Study Areas: Alternative D**

##### ***Livestock Grazing Management Actions***

In this alternative, livestock use would not affect wilderness characteristics in WSAs as described in the other alternatives. The WSAs, or portions of WSAs, within Laidlaw Park and the rest of the Monument, would not be affected by livestock developments and other related infrastructure. Motor vehicle use related to grazing operations on ways, cherry-stems, and boundary routes would be eliminated within the Monument. The removal of all grazing operations within the Monument would result in a long-term moderate impact by enhancing the wilderness values identified for each of the WSAs.

#### **Wilderness Study Areas: Alternative E**

Overall, the changes in grazing between Alternative A and Alternative E would not result in any measurable differences in impacts to WSAs and their suitability.

### **4.2.9. Lands with Wilderness Characteristics**

Lands with wilderness characteristics provide a range of uses and benefits in addition to their value as settings for solitude or primitive and unconfined recreation. BLM's policy and guidance for conducting wilderness characteristics inventories are set forth in Section 201 of FLPMA.

Due to the narrow scope of this plan amendment, decisions are not being made on how these lands will be managed in the future. This is consistent with BLM Manual 6320, page 2.

Initial discussions on lands with wilderness characteristics revealed that there was not a current inventory in the Monument. On March 20, 2014 the Shoshone Field Office conducted an office

exercise to identify wilderness characteristics for the MMP Amendment/EIS. The staff used available GIS information, current travel maps, and resource specialists' knowledge. During April/May/June 2014, staff field verified the presence or absence of wilderness characteristics within the units identified during the office inventory on March 20, 2014.

#### **4.2.9.1. Summary**

No management actions are proposed in this plan amendment for lands with wilderness characteristics.

Under Alternatives A, B, C, and E, livestock grazing would still be present. Grazing may continue to occur in lands with wilderness characteristics. Under each of these alternatives, the overall impacts to lands with wilderness characteristics would be negligible to moderate detractions of wilderness character, while some management actions in Alternatives B and E may have negligible enhancements to wilderness character. There are no discernible differences in impacts to wilderness character amongst the alternatives that allow livestock grazing.

Under Alternative D, lands with wilderness characteristics would no longer be impacted from livestock operations. Although livestock grazing is allowed in lands with wilderness characteristics, the complete removal of livestock and associated infrastructure would provide overall moderate enhancements to existing wilderness characteristics.

#### **4.2.9.2. How Activities Affect Lands with Wilderness Characteristics**

##### ***Water Resources Management Actions***

Restoring riparian areas to PFC and removing any signs of human development would enhance the naturalness characteristics of lands with wilderness characteristics.

##### ***Vegetation Resources Management Actions***

Directing grazing to utilize non-native perennial seedings and to help recovery of sagebrush and seeding diversity would enhance the naturalness of lands with wilderness characteristics. These non-native perennial seedings are sometimes visible as rows and are a human-caused impact.

##### ***Wildlife and Fish Resources Management Actions***

The presence of wildlife in lands with wilderness characteristics are considered to be a supplemental value to the wilderness characteristics. Wildlife actions taken to benefit wildlife would comply with the non-impairment mandate to reduce human impacts.

##### ***Livestock Grazing Management Actions***

Livestock grazing can impact the naturalness, opportunities for solitude, and primitive and unconfined recreation of lands with wilderness character. Where livestock congregate, impacts to the vegetation can be noticeable. The presence of livestock and related infrastructure are noticeable by visitors and can reduce the opportunity for solitude. Motorized vehicle use associated with livestock operations can spread noxious weeds and invasive plant species from infested areas into currently un-infested areas, altering natural conditions.

### **4.2.9.3. Discussion of Impacts by Alternative**

#### **Lands with Wilderness Characteristics: Alternative A**

##### ***Wildlife and Fish Resources Management Actions***

Small-scale construction activities and routine maintenance activities to avoid or minimize disturbance to priority species and their habitat during important seasonal periods would have a direct, minor, short-term impact to wilderness characteristics if they are present. These activities could result in human-made features and human impacts that would reduce naturalness where present. Relatively minor human impacts on naturalness are acceptable so long as they are substantially unnoticeable (BLM Manual 6310, pg. 7). This analysis would be the same for all alternatives.

##### ***Livestock Grazing Management Actions***

Livestock grazing affects wilderness characteristics by altering natural animal and plant communities. These characteristics are also affected by the continued maintenance of and motor vehicle access to range improvements (such as fences and watering sites). Natural wildlife populations and distribution are altered when livestock compete with native wildlife for forage and when predator control activities are undertaken to protect livestock. Temporary roads and livestock developments do not disqualify areas from having wilderness characteristics. Any removal of infrastructure within identified lands with wilderness characteristics would have a direct minor enhancement to the naturalness, opportunities for solitude, and unconfined recreation of those areas. Effects vary, since livestock do not use the lands with wilderness characteristics uniformly.

Vegetation in sheep bed grounds can be substantially altered by repeated annual use, and many areas near the edge of the lava field are grazed only lightly, if at all. Therefore, the effects would vary from negligible to moderate, depending on location. Most effects would be short-term, but potential changes to sagebrush steppe plant and animal communities through the spread of exotic annual grasses could be long-term and difficult to reverse.

Overall, the effect of livestock use on lands with wilderness characteristics could be moderate in some local areas where livestock concentrate because of possible vegetation structure changes and permanent infrastructure. At the landscape scale, livestock use on lands with wilderness characteristics would be negligible to minor since livestock use would be dispersed throughout the planning area and any wilderness characteristics that may be present.

#### **Lands with Wilderness Characteristics: Alternative B**

##### ***Water Resources Management Actions***

Restoration of riparian areas enhance naturalness by creating a more natural appearance and helping re-establish native species. This would be a direct, long-term, negligible to minor impact. The impact would be the same for Alternatives C and D.

##### ***Vegetation Resources Management Actions***

Grazing that is focused on non-native perennial seedings could have a long-term, indirect minor to moderate enhancement to naturalness depending on success of diverse, native vegetation re-establishment.

***Livestock Grazing Management Actions***

In this alternative, the impacts from grazing would be similar to Alternative A; however, with 20% reduction in livestock grazing from average actual use, the intensity of impacts to lands with wilderness characteristics could be reduced, depending on use levels and patterns of those lands.

If an allotment containing wilderness characteristics is retired there would be a direct, long-term, minor to moderate enhancement to wilderness values in those areas by removing the human impacts of grazing administration.

**Lands with Wilderness Characteristics: Alternative C*****Vegetation Resources Management Actions***

Grazing that is focused on non-native perennial seedings could have a long-term, indirect, minor to moderate enhancement to naturalness depending on success of diverse, native vegetation re-establishment. These impacts would be enhancements to the naturalness of the wilderness characteristics. Where fences would be constructed for reference areas within or adjacent to lands with wilderness characteristics, there would possibly be impacts to those values from fencing and the differences in vegetation utilization between the reference and non-reference areas. These human impacts would be direct, minor, short-term impacts for the duration of the reference areas and once the area is removed.

***Livestock Grazing Management Actions***

Overall, the changes in grazing between Alternative A and Alternative C would not result in any measurable differences in impacts to wilderness characteristics where they exist.

**Lands with Wilderness Characteristics: Alternative D*****Livestock Grazing Management Actions***

In this alternative, livestock use would not affect wilderness characteristics as described in the other alternatives. The wilderness characteristics would not be affected by livestock developments and other related infrastructure within Laidlaw Park and the rest of the Monument. The removal of all grazing operations within the Monument would result in a long-term moderate enhancement to the wilderness values identified in the lands with wilderness characteristics.

**Lands with Wilderness Characteristics: Alternative E*****Livestock Grazing Management Actions***

Overall, the changes in grazing between Alternative A and Alternative E would not result in any measurable differences in impacts to wilderness characteristics where they exist.

**4.2.10. Livestock Grazing****4.2.10.1. Summary**

The types of impacts upon livestock grazing are similar among the alternatives, however, each alternative varies in the degree of those impacts. In general, Alternative A would be the least restrictive upon livestock grazing, by having the fewest restrictions on range improvements and

areas available to grazing, along with the highest available AUMs. As a result, lessees and permittees would have a broader range of management options to support grazing operations. Alternative A would have moderate impacts upon livestock grazing.

Alternative C has more impacts than Alternative A, primarily because of the restrictions placed upon range improvements. Impacts on livestock grazing from management restrictions in timing, season of use, LHAs, and vegetation management are more difficult to quantify, but also have major long-term impacts when compared to the No Action Alternative.

Alternative E has greater impacts than Alternative C, primarily through the closure of some areas to livestock and a nearly 50% reduction in AUMs allocated under the 2007 MMP. Many other actions in Alternative E are similar to those of Alternative A or C, but they are more restrictive upon livestock grazing and therefore have more severe impacts.

Alternative B would be the most restrictive on grazing management while still allowing grazing to occur. Alternative B has greater impacts than Alternatives A, C, and E, because of the closure of more areas to livestock and the 75% reduction in AUMs allocated under the 2007 MMP. Many of the other actions in Alternative B are similar to those of Alternative C, but they are more restrictive upon livestock grazing and therefore have more severe impacts.

Alternative D has the highest degree of impacts on livestock grazing of all other alternatives. Livestock grazing would not be permitted within the Monument. This would cause the greatest direct impacts upon livestock grazing and the greatest indirect impacts on those areas outside the Monument in allotments that span the Monument boundary.

#### **4.2.10.2. Assumptions**

Indicators of impacts to livestock grazing/range management are as follows:

- Changes in permitted AUMs in areas open to livestock grazing
- Changes in the type of livestock permitted on allotments
- Prohibitions or limitations on the construction or maintenance of structural and nonstructural range improvements
- Modifications to or removal of structural range improvements
- Closures of areas to livestock grazing for the life of the plan
- Changes to the timing, duration, or frequency of permitted use, including temporary closures

The analysis includes the following assumptions:

- Under all alternatives, all new and renewed leases and permits would be subject to terms and conditions determined to be necessary by the authorizing officer to achieve the management and resource objectives and to Standards for BLM-administered lands.
- Changes in resource condition would be identified through monitoring according to current BLM protocols.
- Changes in livestock management would be made on an allotment- or pasture-specific basis to achieve resource objectives.

- Range improvements (e.g., fences, pipelines, water wells, troughs, and reservoirs) could create a localized loss of vegetation cover. Fencing would cause a temporary loss due to construction, whereas other types of improvements may cause vegetation loss over the improvements' useful life. Additionally, wells, troughs, and reservoirs might cause long-term loss of desirable vegetation due to repeated livestock disturbance where animals congregate, and could be restored only if abandoned.
- The construction and maintenance of range improvements would continue in the planning area, and would vary according to the constraints imposed by each alternative. New range improvements would be subject to limitations, as defined in the amended MMP. Range improvements are generally intended to improve livestock distribution and management, which would maintain or improve rangeland health and could benefit the forage base and wildlife habitat.
- Permitted AUMs allocated to livestock grazing would be determined on an allotment-specific basis during the implementation of the amended MMP and would provide for the needs of vegetation communities and wildlife habitat.
- Management actions that limit or restrict livestock use within the Monument would result in increased livestock use outside the Monument.

#### **4.2.10.3. How Activities Affect Livestock Grazing**

Impacts on livestock grazing are generally the result of management actions that limit, reduce, or prohibit livestock grazing or AUMs in the planning area. Actions that degrade rangeland health and forage production, or that restrict areas open to grazing, the season of use, timing, or the ability to construct and maintain range improvements would result in impacts that make livestock grazing more difficult to manage. Management actions that make livestock grazing management more flexible include those that increase AUMs, decrease restrictions on livestock grazing, improve rangeland health or livestock forage, distribute livestock in ways that increase access to forage, or reduce costs to livestock grazing management. Direct impacts to livestock grazing result from those management actions that change AUM allocations or restrict grazing management practices. Indirect impacts are those that affect rangeland health and productivity or result in a change in livestock grazing management. Key types of impacts analyzed in this document are detailed in the following sections.

In the following discussion, impacts upon livestock grazing are referred to as positive or beneficial if they increase management flexibility, reduce complexity, make more forage available, or make forage more accessible. Impacts upon livestock grazing are referred to as negative, adverse, or detrimental if they make management more difficult, more complex, reduce available forage, or make access to the forage more difficult. When discussing or referring to other resources in this section, a positive or beneficial impact is one that leads the resource towards the DFCs, and negative or detrimental impacts lead the resource away from DFCs.

#### ***Water Resources Management Actions***

Unregimented livestock grazing can impact riparian ecosystem function [Armour et al., 1991]; therefore, managing riparian habitat can directly impact livestock grazing through excluding livestock at specific sites, increasing herding, adding range improvements (such as cross fences and water gaps), and adjusting season of use and livestock numbers. Managing riparian habitat to maintain PFC is required for BLM-administered lands [43 CFR 4180.2(e)(3)]. It benefits

grazing livestock indirectly by providing cleaner and more reliable water sources and more dependable forage availability. The BLM has been managing riparian and wetland areas for these objectives since at least 1997, though additional impacts could occur as other management needs are identified and implemented.

Protecting water quality and watershed health is a requirement of the Idaho Standards for Rangeland Health as well as state and federal water quality standards. If additional management needs are identified and implemented, changes could be required in livestock management, such as deferring or shortening grazing periods, adding range improvements, excluding grazing from riparian areas, establishing riparian pastures, and increasing livestock herding. In areas requiring exclusion of livestock or other restrictions on livestock management, these limitations could increase costs to permittees and lessees.

Climate modeling has predicted increased variability and frequency of floods and droughts in this region [Chambers & Pellant, 2008]. This may lead to changes in springs and seeps, causing them to dry up earlier, and resulting in a change in livestock use patterns [Ecoregional Assessment Program, 2013]. This would require increased riparian monitoring, at least on a temporary basis, and more intense livestock management to ensure that riparian areas continue to meet Standards.

### ***Vegetation Resources Management Actions***

Managing grazing to manipulate vegetation communities may indirectly affect livestock grazing by increasing vegetation productivity and improving forage in the long term. This would be the case especially where current conditions are not meeting Standards and invasive plants are common. For example, in allotments with a history of intensive grazing, transitions in the composition of sagebrush communities may have occurred that have reduced native perennial grasses and forage for livestock. This can lead to wide variation in the amount of forage available to livestock due to the increased dominance of annual species such as cheatgrass. However, when grazing management is put into place to promote health and vigor of the herbaceous community, it may result in a short-term reduction in available forage, but in the long term a healthy plant community would provide a more stable forage base for livestock [Klemmedson & Smith, 1964]. Some areas would require additional active restoration, such as reseeding grasses and forbs or controlling invasive species.

Vegetation management designed to curb the incursion or encroachment of non-native invasive annual grasses could reduce forage availability in the short term. However, these treatments generally enhance rangeland conditions in the long term [NTT, 2011].

The management of vegetation communities using natural disturbance regimes, such as prescribed grazing, and using vegetative treatments to accomplish biodiversity objectives and improve plant community resilience could also benefit livestock grazing in the long term by maintaining a more consistent forage supply. However, activities that are more management intensive, such as prescribed grazing could also increase complexity and difficulty of managing grazing.

As noted in the discussion of vegetation, climate change may lead to species composition shifts in plant communities. As species composition shifts, livestock grazing patterns will also shift, requiring re-assessment of grazing systems and practices to ensure that grazing allotments meet or make progress towards meeting Standards.

### ***Wildlife and Fish Resources Management Actions***



Most actions that are beneficial to fish and wildlife habitat are also beneficial to livestock grazing in the long term. However, the actions that avoid direct competition or interaction between livestock and wildlife are typically more restrictive to livestock grazing, and therefore, may have a negative impact. For example, improving riparian ecosystems tends to have long-term, beneficial impacts on livestock grazing by improving forage productivity and water quality. However, restricting the times that a range improvement could be used, such as to avoid disturbing sage-grouse on a lek, would have a detrimental impact upon livestock grazing through restricting access to water and forage.

### ***Livestock Grazing Management Actions***

Changes in livestock grazing management could impact grazing opportunities in a variety of ways. For example, implementing particular livestock grazing management requirements to benefit sage-grouse could affect livestock grazing. Some management requirements may result in short-term and long-term increased costs to permittees and lessees, or AUMs could decrease for some permittees and lessees due to the following:

- Implementation or modification of a grazing strategy
- Change in season of use, livestock kind, or livestock class
- Construction or modification of range improvements, when ability to disperse livestock is impacted
- Viability of existing operations could be compromised if grazing seasons or areas of use are eliminated or severely restricted.

These management requirements could result in direct and indirect impacts on individuals. For example, if a ranch were seasonally dependent on forage from BLM-administered lands, a reduction or elimination of AUMs may affect the entire ranching operation by reducing the total amount of available forage [Torell et al., 2002].

Permittees and lessees and/or the BLM may incur a short-term cost from some management actions that will result in long-term benefits. For example, construction of range improvements to improve livestock distribution and allow use across a larger portion of the rangeland would generally enhance rangeland health in the long term; however, it would have short-term costs.

Constructing off-site water sources and fencing riparian and spring sources could keep livestock away from sensitive riparian areas and provide a cleaner, more reliable source of water for livestock; however, it would represent an increased cost for permittees through increased construction and maintenance costs. Other requirements could increase annual operating costs, such as increased time feeding animals on private land due to shortened or changed seasons of use, more complex pasture rotations or herding on public land, which requires increased labor and fuels costs for moving animals, or annually maintaining let-down fences.

Restricting the locations of new grazing infrastructure would limit livestock access to available forage. There are many areas of the Monument with very little infrastructure, especially livestock watering sources. As a result, very little grazing occurs in these areas, though forage production is sufficient to allow it. With new water sources in these areas, this forage would become more accessible to livestock.

In instances where an allotment is closed to grazing or AUMs are reduced for vegetation objectives, the agency may have to compensate the permittee or lessee for the range improvement projects constructed under a range improvement permit or cooperative agreement, in accordance with 43 CFR 4120.3-6(c).

#### **4.2.10.4. Discussion of Impacts by Alternative**

##### **Livestock Grazing: Alternative A**

###### ***Water Resources Management Actions***

Under Alternative A, there would be no changes in management for water resources. Natural water sources are currently managed for PFC, and the mechanisms to reach PFC are available under this alternative. This alternative continues the existing BMPs and protection from accelerated or unnatural erosion in the current plan. Continuing to implement projects designed to enhance watershed health will improve vegetation resources and will improve water and forage for livestock over the long term. Adjustments in livestock grazing, however, may be necessary to meet water or soil resource related Standards and could result in short-term, adverse impacts to livestock grazing.

###### ***Vegetation Resources Management Actions***

Under Alternative A, there would be no changes in management for vegetation, including special status species and fire management. Existing sagebrush steppe communities would be protected to prevent loss of shrub cover, and would be managed to prevent or inhibit invasive species infestation or expansion, and promote a desirable herbaceous understory. Management that promotes healthy perennial herbaceous understory communities would improve livestock forage in the long term.

Under Alternative A, restoration would continue in the planning area, with long-term benefits to livestock forage. Localized areas may see reductions in available forage by the re-establishment of sagebrush, however, other areas with poor understory vegetation would provide higher forage value for livestock after restoration. Vegetation would be managed to improve plant communities, and impacts on range management from these actions would be minimal. All of these actions, however, could require adjustment to livestock grazing management. Management for noxious weeds or invasive plant species would continue under the direction of current management plans, with the focus on areas not meeting Standards or DFCs.

###### ***Wildlife and Fish Resources Management Actions***

Under Alternative A, there would be no changes in management for wildlife, including special status species. Inventory and monitoring of wildlife will focus on species of special concern and to detect species population decline. Land use authorizations will be required to include actions and stipulations necessary to protect special status species. Small-scale construction and routine maintenance activities would be scheduled to avoid or minimize disturbance to priority species and their habitat during important seasonal periods.

Actions designed to avoid direct competition or interaction between livestock and wildlife tend to be more restrictive to livestock grazing, and therefore may have a negative impact. However, actions that improve wildlife habitat also tend to be beneficial to livestock grazing in the long term by improving forage conditions. Restricting the timing of range improvement maintenance,

such as to avoid disturbing sage-grouse on a lek, would have a moderate impact upon livestock grazing by limiting access to range improvements and forage. Routine maintenance generally occurs in the spring before livestock turn-out. Natural deterioration of range improvements, such as fences, is accelerated over winter due to freezing and thawing or weighting from snow. Therefore, maintenance in the fall or winter, after the grazing season, would result in the need for additional maintenance prior to turn-out in the spring.

### ***Livestock Grazing Management Actions***

There would be no changes to livestock grazing management under Alternative A. Approximately 273,900 acres of BLM land would be made available for livestock use, while approximately 1,200 acres would not be available. Permitted livestock use would total 38,187 AUMs, and livestock use authorizations would be subject to Standards. Management of livestock grazing is designed to provide for protection or enhancement of other resource values. Where Standards are not being met due to livestock, adjustments in livestock grazing would be necessary. This would cause short-term, detrimental impacts, such as reduced stocking rates, but long-term benefits such as increased forage quality. Likely impacts would include restrictions on seasons of use, grazing schedules, or stocking levels, with a result in increases of available forage over the long term.

Range improvements would continue to be a part of livestock grazing management, including in Primitive and Pristine Zones (Figure 2.3, “Craters of the Moon National Monument and Preserve Management Zones” (p. 34)), but removal could occur to accomplish resource objectives. New range improvements would be limited in the Bowl Crater Allotment and the North Pasture of Laidlaw Park Allotment. Range improvements could also be removed if current management determines that they are redundant or unneeded. If range improvements are unneeded or redundant for livestock grazing management there would be negligible to minimal effects on livestock grazing. However, it could have adverse impacts upon livestock grazing by removing a water source or fencing that might be needed to facilitate grazing management, but is unneeded for another resource or resource use. If a water source was removed, livestock grazing pressure would shift to other areas in an allotment, causing higher utilization in some areas. This could reduce available forage for livestock and could require an adjustment in stocking rate.

### **Livestock Grazing: Alternative B**

#### ***Water Resources Management Actions***

There are few riparian areas within the Monument, and those are localized north of Highway 93/20/26 in the foothills of the Pioneer Mountains. These riparian areas are generally in PFC or Functional-at-Risk. The effects from water resource management on livestock grazing would depend upon the measures taken to attain reference state vegetation. The riparian areas are used by livestock, however, none on BLM land are indispensable for the management of the allotments. Livestock exclosures would be simple and effective methods to ensure that livestock do not negatively impact the riparian areas. In allotments permitted for sheep use, simple herding practices would also be effective, causing minimal impacts. If exclosure fences were not allowed in allotments with cattle permits due to other BLM policy or management decisions, the effects upon livestock grazing management would be the greatest because herding and other practices are less effective for cattle than fences, and other mitigating measures would be needed, such as closing a pasture or seasonal restrictions. This would have moderate impacts on livestock grazing management with long-term effects by increasing the difficulty and complexity of livestock management in order to reach reference states for riparian areas.

### ***Vegetation Resources Management Actions***

Under Alternative B, livestock grazing would be directed to prioritize utilization on non-native perennial seedings. This could require additional effort by the permittees or additional infrastructure to control the livestock and direct use to these seedings, particularly if high use levels are desired (i.e. to effect change in the seeding composition). Directing livestock to these areas that tend to be more resilient from livestock grazing, and thus reducing use in other more sensitive areas could result in improving rangeland conditions in lesser-grazed areas through lighter utilization. If changes in species composition is the desired goal in the seeding (such as re-establishing sagebrush), then livestock management could be affected by reducing available forage over the long term because these seedings usually have the highest forage productivity and the greatest resiliency to grazing.

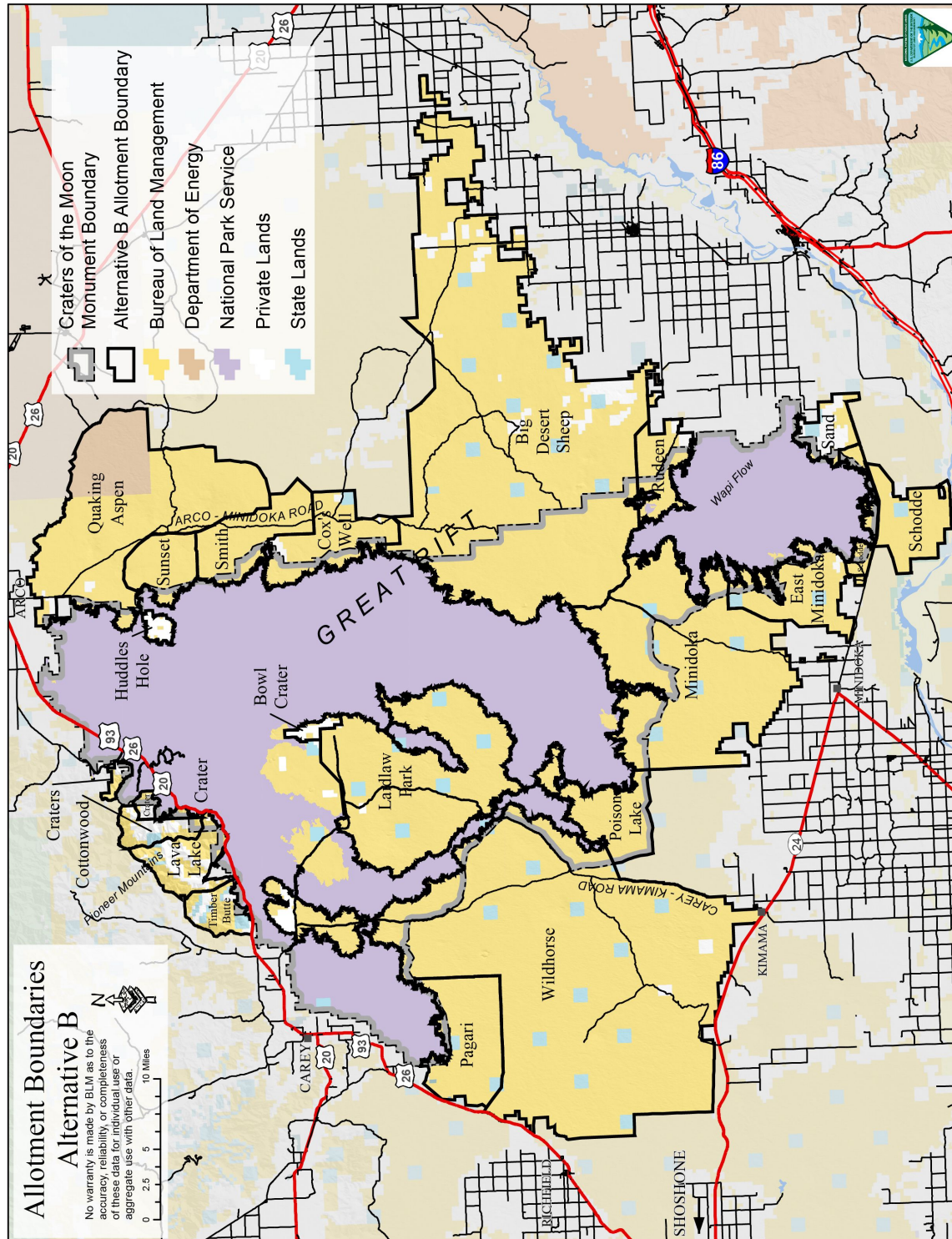
### ***Wildlife and Fish Resources Management Actions***

There would be no impacts upon livestock grazing management from wildlife and fish management actions in Alternative B.

### ***Livestock Grazing Management Actions***

This alternative includes several management actions that limit or dictate the type, location, and design of range improvements, as well as limit the season in which they can be used. Each of these actions may not result in a major impact to livestock grazing individually, but collectively would result in major, long-term impacts. Range improvements are designed to improve livestock distribution or handling, and to help maintain or improve vegetation condition across the landscape. This alternative severely limits this ability, and would make it more difficult to manage livestock in a way that does not impair land health. While overall livestock use in the Monument would be reduced in this alternative, the use that would still be allowed would be concentrated in certain areas during certain seasons because many range improvements would not be available. Most areas that are unsuitable for sage-grouse breeding habitat are lacking in sagebrush but have adequate herbaceous components. While managing for overall achievement of Standards, concentrating use in those areas in the spring may reduce the suitability of the herbaceous component, whereas more dispersed use would also disperse the impacts, rendering them much less severe.

Removing livestock grazing in the Little Park, the North Pasture of Laidlaw Park Allotment, Larkspur Park, the North Pasture of Bowl Crater Allotment, and Park Field kipuka would cause major, long-term impacts to livestock grazing management Figure 4.1, “Livestock Grazing Allotments-Alternative B”. The action would make two pastures of the Laidlaw Park Allotment (Little Park and the North Pasture) unavailable to grazing, reducing the area available to livestock by 17,700 acres (20% of the allotment). The North Pasture of Bowl Crater Allotment is 700 acres (53% of the allotment). The Park Field and Larkspur Park in the East Minidoka and Minidoka Allotments, respectively, are less essential to the management of those allotments overall, but would still require adjustments to the management schemes. The South Pasture of the Craters Allotment is not currently used by livestock and making it unavailable would not affect livestock grazing. A 20% reduction from average Actual Use would result in a reduction of 28,755 AUMs (or about 75% reduced from permitted use) when compared to Alternative A.



**Figure 4.1. Livestock Grazing Allotments-Alternative B**

This alternative also requires that BLM evaluate existing range improvements and possibly decommission, relocate, or otherwise modify them. These types of actions have similar effects on livestock grazing as those limitations on new range improvements. There may also be moderate impacts to livestock grazing management through the removal of range improvements in areas not available to livestock grazing. For example, water storage and/or wells that are currently used may still be necessary to allow grazing to continue in those areas that remain available for livestock grazing. This alternative would make some range improvements unavailable for use and/or limit the ability to create new livestock developments in order to manage livestock grazing. This would cause major impacts to livestock grazing in those areas that continue to be available for livestock grazing.

Limiting the ability to locate supplements or some structural range improvements near the lava edge also limits livestock distribution. This would make management for Standards more difficult, but mitigating measures such as alternate sites would likely be found or other areas of allotments outside the Monument boundary might be found to reduce the effects upon livestock grazing. This would also tend to concentrate livestock grazing impacts to those areas outside the Monument in allotments that span the Monument boundary.

This alternative would cause minor impacts to the Kimama and Poison Lake Allotments. The current boundary between the allotments is primarily along a major road, as is the Monument boundary. However there are a few areas where there is some overlap, causing small areas of the Poison Lake Allotment to lie outside the Monument and small areas of the Kimama Allotment to lie within the Monument. This alternative would realign the boundaries of the allotments to fully include the Poison Lake Allotment within the Monument and fully exclude the Kimama Allotment from the Monument. Implementation of this alternative would result in no net increase in fencing between the allotments. There would be a net increase of 740 acres in the Poison Lake Allotment and a corresponding net decrease of 740 acres in the Kimama Allotment.

Retiring an allotment from livestock use once a permit is relinquished would, in effect, make it unavailable for livestock use. The amount of area that would be left unused by livestock would depend upon the allotment affected, the other ownerships involved in the affected area, and whether the allotment spans the Monument boundary. In those allotments that span the Monument boundary, suspending livestock grazing within the Monument does not necessarily correspond to suspending livestock grazing outside the Monument. This also goes for those areas with State of Idaho or private lands intermingled with the BLM land.

This alternative includes seasonal restrictions on livestock grazing based on the sage-grouse life cycle. This action would result in major long-term impacts to livestock grazing. In addition to those areas not available to grazing, 192,000 acres of breeding and early brood rearing habitat that is currently used during that period would not be available to livestock grazing from March 15 to June 15.

Many of the permittees in the Monument use their BLM allotments in the spring and early summer as a part of a larger operation that includes private pasture and Forest Service allotments. Changing the timing of the permit in the Monument allotments would require shifting use on the Forest Service permits and on private land to manage their operation. These habitat restrictions would result in a wide range in seasonal and annual variation in available forage for livestock. This would make livestock grazing management much more complex, requiring seasonal and annual adjustments to grazing systems, allowed forage consumption, and would require intense seasonal monitoring. These habitat boundaries are not along any particular livestock movement

boundary, so managing livestock to avoid use in these areas would be exceedingly difficult with the limitations on construction of range improvements placed through other BLM management direction.

## **Livestock Grazing: Alternative C**

### ***Water Resources Management Actions***

Under this alternative, all riparian areas would be restored to PFC. Unregimented livestock grazing can have adverse impacts on riparian ecosystems [Armour et al., 1991]; therefore, managing riparian habitat can directly impact livestock grazing through excluding livestock at specific sites, increasing herding, adding range improvements (such as cross fences and water gaps), and adjusting season of use and livestock numbers. Managing riparian vegetation to maintain PFC is required for BLM-administered lands [43CFR 4180.2(e)(3)]. It benefits grazing livestock by indirectly providing cleaner and more reliable water sources and more dependable forage availability. The BLM has been managing riparian and wetland areas for these objectives since at least 1997, though additional impacts could occur as new management needs are identified and implemented.

### ***Vegetation Resources Management Actions***

Under Alternative C, livestock grazing would be directed to prioritize utilization on non-native perennial seedings, as well as focused on sagebrush recovery. This could require additional effort by the permittees or additional infrastructure to control the livestock and direct use to these seedings, particularly if high use levels are desired (i.e. to affect change in the seeding composition). Directing livestock to these areas that tend to be more resilient from livestock grazing, and thus reducing use in other more sensitive areas could result in improving rangeland conditions through consistently lighter utilization. If changes in species composition is the desired goal in the seeding (i.e. re-establishing sagebrush), then livestock management could be affected by reducing available forage over the long term because these seedings usually have the highest forage productivity and the greatest resiliency to grazing. The effects under this alternative would be greater than under Alternative B because the overall use levels would be greater due to higher AUM allocation. Therefore, greater effort would be required to ensure that Standards continue to be met.

Reference areas would be established to study the effects of livestock grazing on different vegetation communities. The effects of this management action would be negligible due to the small scale of the enclosure areas. Size and placement of these reference areas would need to be in areas that would show differences, therefore they would need to be in areas used by livestock. As long as placement of these reference areas is not such that it hinders livestock movement and dispersal throughout the pasture, then effects would be negligible. These enclosures would likely be small enough that adjustments in permitted AUMs would not be necessary to offset the loss of livestock forage availability.

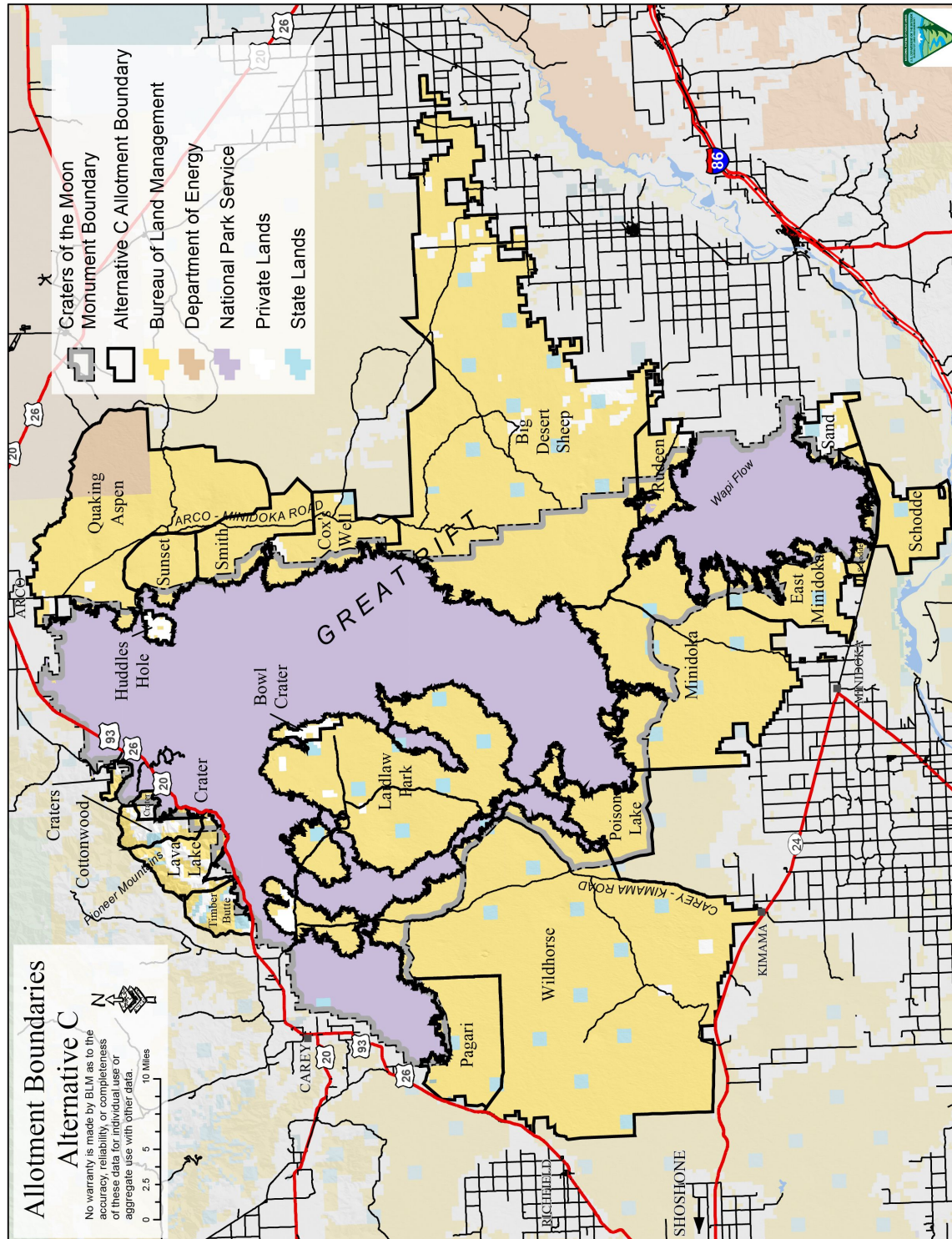
### ***Wildlife and Fish Resources Management Actions***

Under Alternative C, impacts to livestock grazing from wildlife management, including special status species management, would be similar to Alternative A.

### ***Livestock Grazing Management Actions***

Under Alternative C, permitted livestock use totals 37,792 AUMs. The current livestock use authorizations will be maintained until LHAs are completed and the BLM determines that adjustments in livestock use are necessary to meet Standards, vegetation, wildlife, livestock, or resource objectives, or AUM levels set in this amendment. There would be a net decrease of 155 AUMs, due to the adjustment of the Kimama/Poison Lake Allotment boundary that places the area of Kimama Allotment that is within the Monument into the Poison Lake Allotment (Figure 4.2, “Livestock Grazing Allotments-Alternative C”).





**Figure 4.2. Livestock Grazing Allotments-Alternative C**

The Kimama Allotment is to be excluded from the Monument under this alternative; therefore those AUMs will also be excluded and not re-allocated. The current boundary between the allotments is primarily along a major road, as is the Monument boundary. However there are a few areas where there is some overlap, causing small areas of the Poison Lake Allotment to lie outside the Monument and small areas of the Kimama Allotment to lie within the Monument. This would realign the boundaries of the allotments to fully include the Poison Lake Allotment within the Monument and fully exclude the Kimama Allotment from the Monument. The implementation would require only relocating a fence and result in no net increase in fencing between the allotments. There would be a net increase of 740 acres in the Poison Lake Allotment and a corresponding net decrease of 740 acres in the Kimama Allotment. This would result in a 155 AUM decrease in the Monument (all those within the Kimama Allotment). Permit adjustments are not anticipated to be necessary due to this action, but they will be evaluated during the Land Health Assessments.

There would be 273,600 acres of BLM land made available for livestock use, with 1,500 acres made unavailable. The effects of this action would be negligible. The areas made unavailable to livestock through this management action are currently not used by livestock, therefore the management of livestock would not be affected.

Existing range improvements would continue to be a part of livestock grazing management, however all would be evaluated for potential removal, consolidation, or decommissioning. This could have adverse impacts upon livestock grazing by removing a water source or fencing that might be needed to facilitate grazing management. If a water source was removed, livestock grazing pressure would shift to other areas in an allotment, reducing grazing pressure at that location, but causing higher utilization in some areas because of poorer distribution of livestock. This could reduce available forage for livestock because of distance from water and could require an adjustment in stocking rate.

This alternative includes limitations on the placement and design of new range improvements and the placement of supplements. This action has the potential to have moderate impacts to livestock grazing, because limiting the ability to locate supplements or some structural range improvements near the lava edge also limits livestock distribution. This would make management for Standards more difficult by concentrating livestock use, but mitigating measures would likely be found. The action would also tend to shift livestock grazing use patterns and distribution to other areas.

Retiring an allotment from livestock use once a permit is relinquished would, in effect, make it unavailable for livestock use. The amount of area that would be left unused by livestock would depend upon the allotment affected, the other ownerships involved in the affected area, and whether the allotment spans the Monument boundary. In those allotments that span the Monument boundary, suspending livestock grazing within the Monument does not necessarily correspond to suspending livestock grazing outside the Monument. This also goes for those areas with State of Idaho or private lands intermingled with the BLM land.

Minimizing livestock use in sage-grouse habitat during the breeding and nesting period would, in effect, limit livestock grazing on 192,000 acres during those time periods. Under the current permits, AUMs would be severely limited. However, changing the season of use on the permits could be accomplished during the implementation of this Amendment. Assuming that AUM levels remain the same, livestock use could be shifted to the summer, fall, and winter seasons.

Many of the permittees in the Monument use their BLM allotments in the spring and early summer as a part of a larger operation that includes private pasture and Forest Service allotments.

Changing the timing of the permit in the Monument allotments would require shifting use on the Forest Service permits and on private land to manage their operation. The effects of changing the seasons of use on those other areas is outside the scope of this analysis, but there are generally reasons for permitted seasons of use such as snowpack and plant growth, and drastic changes may not be feasible.

Increasing summer livestock use would increase the demand for water, resulting in a corresponding need for increased water capacity at existing watering sites, or increased numbers of watering sites. If the use were to occur in fall or winter, water use would be less than in summer and there would be less need for watering facilities for livestock. Winter use also results in increased maintenance demands from permittees because pipelines and troughs freeze and need repairs to provide the necessary water. This maintenance increases the ground disturbance frequency though not the overall footprint.

Allowing conversion in kind of livestock from one species to another would have moderate effects on livestock grazing. This would be on a case-by-case basis and in single allotments at a time. It could result in a more comprehensive utilization of forage because of differences in foraging behavior between kinds of livestock. More livestock developments may be necessary to harvest the allowable forage, although developing new infrastructure is more difficult in this alternative than Alternative A.

### **Livestock Grazing: Alternative D**

#### ***Water Resources Management Actions***

Livestock grazing would not be allowed in the Monument, therefore it would not be affected by water resources management.

#### ***Vegetation Resources Management Actions***

Livestock grazing would not be allowed in the Monument, therefore it would not be affected by vegetation resources management.

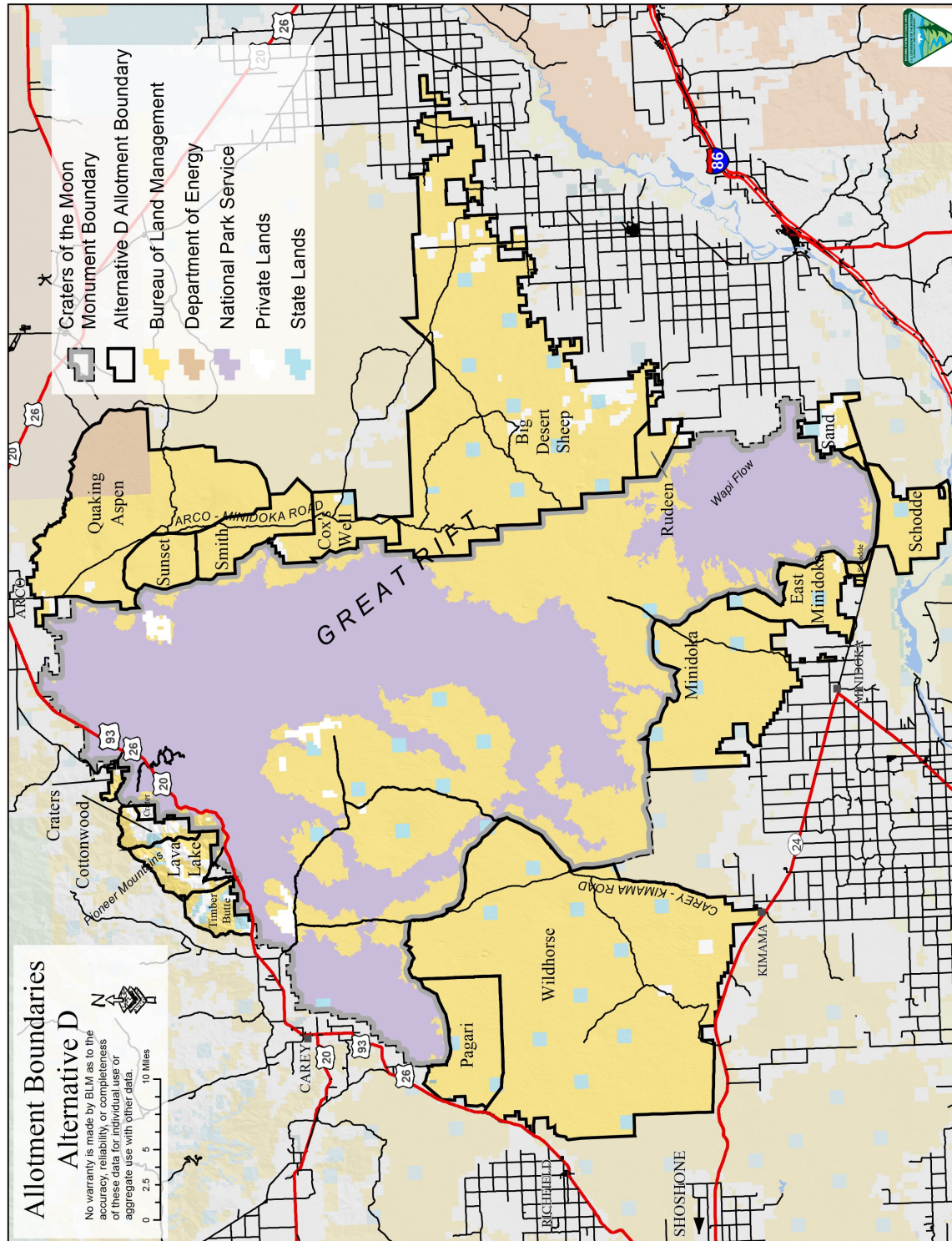
#### ***Wildlife and Fish Resources Management Actions***

There would be no effects to livestock grazing from fish and wildlife management.

#### ***Livestock Grazing Management Actions***

Under this alternative, there would be a reduction in the area available for livestock grazing of 273,900 acres. Additionally, 38,187 AUMs of livestock forage would no longer be made available. Removing the majority of livestock grazing infrastructure in the Monument would have a negligible effect on livestock grazing, as it would no longer be necessary to manage livestock under the “No Grazing” Alternative. However, removal of some infrastructure related to livestock grazing management on public lands would have major, negative, long-term effects on livestock grazing management in those areas directly adjacent to the Monument. The primary range improvements that would have a negative effect if removed would be wells and water storage facilities related to livestock grazing. There are several wells within the Monument that are used to fill water trucks, which are then driven to areas inside and outside the Monument to water livestock. While water use in the Monument would no longer be necessary for livestock grazing, the wells would still be necessary for use in areas outside of the Monument (Figure 4.3, “Livestock Grazing Allotments-Alternative D”).





**Figure 4.3. Livestock Grazing Allotments-Alternative D**

The Kimama/Poison Lake Allotment boundary would be adjusted to exclude Kimama from the Monument. Four allotments would be entirely closed to livestock grazing, while the other 17 would be partially closed to grazing. Of the 38,187 AUMs and 273,900 acres no longer available, Laidlaw Park kipuka, which is the majority of the Laidlaw Park Allotment and all of the Bowl Crater Allotment would account for 10,641 AUMs distributed among 16 grazing permits, and a total of 83,100 acres. This alternative would also completely close the Poison Lake and Huddle's Hole Allotments, which would account for 3,306 AUMs and 19,100 acres. Additionally, Little Park (the remainder of the Laidlaw Park Allotment), the Park Field kipuka, Larkspur Park, and Paddelford Flat kipuka would be closed to grazing accounting for 2,616 AUMs and about 17,300 acres. The remaining 21,324 AUMs and 154,400 acres that would no longer be available are divided among the remaining allotments.

Grazing in the closed areas of the Wildhorse, Big Desert Sheep, and Minidoka Allotments could be prevented through clear marking to inform the sheep herders of the boundary. About 70 miles of marking would be necessary. The remainder of the allotments have cattle permits, and it would be more difficult to prevent grazing in the Monument, as would the Wildhorse, Big Desert Sheep, and Minidoka Allotments if conversions in kind of livestock were to occur in the future.

It would be necessary to change the cattle management in the allotments that span the Monument boundary. Water sources within about one mile of the boundary would not be used, and salt or other supplements would have to be placed away from the boundary. If this is not possible, then the entire pasture would have to be closed to livestock grazing to exclude livestock from the closed area. This would close about 92,100 additional acres to livestock grazing outside the Monument, and reduce the available forage in those allotments.

The most effective method of preventing livestock from crossing the boundary into the Monument would be to fence along the border. To fence the allotments with cattle permits would require about 92 miles of fence. While herding sheep usually effective, fencing would be a more certain means of preventing sheep from entering the allotment, and that would be an additional 70 miles of fence. Fencing would also result in fewer indirect effects upon livestock grazing in those allotments that span the Monument boundary.

### **Livestock Grazing: Alternative E**

#### ***Water Resources Management Actions***

The effects of water resources management actions under Alternative E would be the same as those under Alternative C.

#### ***Vegetation Resources Management Actions***

Under Alternative E, livestock grazing would be directed to prioritize utilization on non-native perennial seedings, as well as focused on sagebrush recovery. This could require additional effort by the permittees or additional infrastructure to control the livestock and direct use to these seedings, particularly if high use levels are desired (i.e. to affect change in the seeding composition). Directing livestock to these areas that tend to be more resilient from livestock grazing, and thus reducing use in other more sensitive areas could result in improving rangeland conditions through consistently lighter utilization. If changes in species composition is the desired goal in the seeding (i.e. re-establishing sagebrush), then livestock management could be affected by reducing available forage over the long term because these seedings usually have the highest forage productivity and the greatest resiliency to grazing. The effects under this

alternative would be greater than under Alternative B because the overall use levels would be greater due to higher AUM allocation. Therefore, greater effort would be required to ensure that Standards continue to be met.

Reference areas would be established to study the effects of livestock grazing on different vegetation communities. The effects of this management action would be negligible due to the small scale of the enclosure areas. Size and placement of these reference areas would need to be in areas that would show differences, therefore they would need to be in areas used by livestock. As long as placement of these reference areas is not such that it hinders livestock movement and dispersal throughout the pasture, then effects would be negligible. These enclosures would likely be small enough that adjustments in permitted AUMs would not be necessary to offset the loss of livestock forage availability.

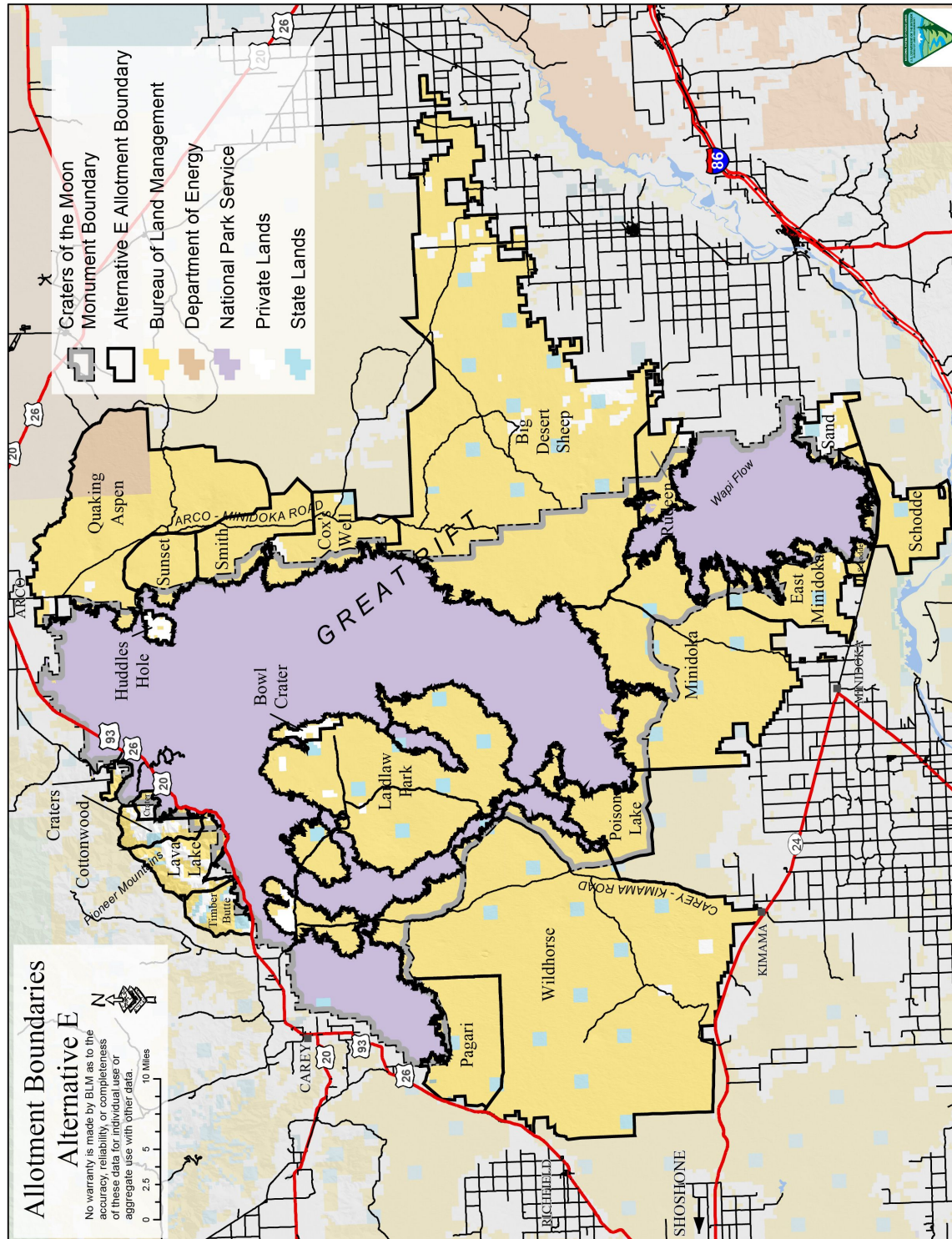
### ***Wildlife and Fish Resources Management Actions***

Under Alternative E, impacts to livestock grazing from wildlife management, including special status species management, would be similar to Alternative A.

### ***Livestock Grazing Management Actions***

Alternative E would be more restrictive on grazing management than Alternatives A and C, but less restrictive on grazing management than Alternatives B and D. Larkspur Park and an area currently in the Craters Allotment would be made unavailable to livestock grazing under this alternative. Allotment boundaries would be adjusted to exclude those areas. Approximately 2,200 acres would be unavailable for livestock grazing, including the 1,200 acres already unavailable in the 2007 MMP. There would also be a boundary adjustment between the Kimama and Poison Lake Allotments to coincide with the Monument and Preserve boundary (Figure 4.4, “Livestock Grazing Allotments-Alternative E”). The remainder of the Monument (272,800 acres of public lands) would be available for livestock grazing for the life of the plan.





**Figure 4.4. Livestock Grazing Allotments-Alternative E**

Under Alternative E, permitted livestock use equals the sum of the high Actual Use of each allotment since 1997, or 19,388 AUMs. The current livestock use authorizations would be maintained until LHAs are completed and the BLM determines that adjustments in livestock use are necessary to meet Standards, vegetation, wildlife, livestock, or resource objectives, or AUM levels set in this amendment. There would be a net decrease of 18,849 available AUMs.

The Kimama Allotment is to be excluded from the Monument under this alternative; therefore those AUMs will also be excluded and not re-allocated. The current boundary between the allotments is primarily along a major road, as is the Monument boundary. However there are a few areas where there is some overlap, causing small areas of the Poison Lake Allotment to lie outside the Monument and small areas of the Kimama Allotment to lie within the Monument. This would realign the boundaries of the allotments to fully include the Poison Lake Allotment within the Monument and fully exclude the Kimama Allotment from the Monument. The implementation would require only relocating a fence and result in no net increase in fencing between the allotments. There would be a net increase of 740 acres in the Poison Lake Allotment and a corresponding net decrease of 740 acres in the Kimama Allotment. Permit adjustments are not anticipated to be necessary due to this action, but they will be evaluated during the term permit renewals.

Existing range improvements would continue to be a part of livestock grazing management, however all would be evaluated for potential removal, consolidation, or decommissioning. This could have adverse impacts upon livestock grazing by removing a water source or fencing that might be needed to facilitate grazing management. If a water source was removed, livestock grazing pressure would shift to other areas in an allotment, reducing grazing pressure at that location, but causing higher utilization in some areas because of poorer distribution of livestock. This could reduce available forage for livestock because of distance from water and could require an adjustment in stocking rate.

This alternative includes limitations on the placement and design of new range improvements and the placement of supplements. This action has the potential to have moderate impacts to livestock grazing, because limiting the ability to locate supplements or some structural range improvements near the lava edge or in other new areas also limits livestock distribution. This would make management for Standards more difficult by concentrating livestock use, but mitigating measures would likely be found. The action would also tend to shift livestock grazing use patterns and distribution to other areas.

Retiring an allotment from livestock use once a permit is relinquished would, in effect, make it unavailable for livestock use. The amount of area that would be left unused by livestock would depend upon the allotment affected, the other ownerships involved in the affected area, and whether the allotment spans the Monument boundary. In those allotments that span the Monument boundary, suspending livestock grazing within the Monument does not necessarily correspond to suspending livestock grazing outside the Monument. This also goes for those areas with State of Idaho or private lands intermingled with the BLM land. Suspending livestock grazing in the remainder of allotments outside the Monument boundary would require a LUP amendment to make them unavailable. If suspending livestock grazing outside the Monument boundary was the goal and there was a LUP amendment, similar effects to infrastructure could be assumed as in areas made unavailable through this analysis.

Minimizing livestock use in sage-grouse habitat during the breeding and nesting period would, in effect, limit livestock grazing on 192,000 acres during those time periods. Under the current



permits, AUMs would be severely limited. However, changing the season of use on the permits could be accomplished during the implementation of this Amendment. Assuming that AUM levels remain the same, livestock use could be shifted to the summer, fall, and winter seasons.

Many of the permittees in the Monument use their BLM allotments in the spring and early summer as a part of a larger operation that includes private pasture and Forest Service allotments. Changing the timing of the permit in the Monument allotments would require shifting use on the Forest Service permits and on private land to manage their operation. The effects of changing the seasons of use on those other areas is outside the scope of this analysis, but there are generally reasons for permitted seasons of use such as snowpack and plant growth, and drastic changes may not be feasible.

Increasing summer livestock use would increase the demand for water, resulting in a corresponding need for increased water capacity at existing watering sites, or increased numbers of watering sites. If the use were to occur in fall or winter, water use would be less than in summer and there would be less need for watering facilities for livestock. Winter use also results in increased maintenance demands from permittees because pipelines and troughs freeze and need repairs to provide the necessary water. This maintenance increases the ground disturbance frequency though not the overall footprint.

Allowing conversion in kind of livestock from one species to another would have moderate effects on livestock grazing. This would be on a case-by-case basis and in single allotments at a time. It could result in a more comprehensive utilization of forage because of differences in foraging behavior between kinds of livestock. More livestock developments may be necessary to harvest the allowable forage, although developing new infrastructure is more difficult in this alternative than Alternatives A or C.

## **4.2.11. Travel and Transportation**

The region of influence used for the transportation analysis is the planning area. Travel and transportation is managed under the direction set forth in the 2007 MMP and the Craters of the Moon National Monument and Preserve Comprehensive Travel Management Plan. The Monument route network was originally established to facilitate grazing operations and fire operations, with some routes established by recreation use for purposes such as hunting.

The Craters of the Moon National Monument and Preserve Comprehensive Travel Management Plan was completed in 2009.

### **4.2.11.1. Summary**

No management actions are proposed in this plan amendment for transportation.

The 2007 MMP indicates that the routes throughout the Monument accommodate recreation visitors, non-Federal landowners, livestock grazing operations, and administrative needs. Most motorized use is related to livestock grazing administration; however, the total motorized use within the Monument is very low.

Under Alternatives A, B, C, and E, livestock operations would still exist; therefore, the travel network would still be utilized by grazing operations. However, with the reduction of grazing operations in Alternative B and E, the associated routes for those closed areas would experience a

moderate to major reduction in use. Under Alternative D, all grazing would be removed from the Monument resulting in most routes being utilized for recreation visitors, non-Federal landowners, and agency resource management. Some routes would still be needed to provide access to State and private lands where grazing would continue. Under Alternatives A and C the overall impacts to travel and transportation would be negligible. Under Alternative B and E the overall impacts to travel and transportation would be minor to moderate. Under Alternative D, the overall impacts to travel and transportation would be moderate to major.

Proposed management actions will be in accordance with the DFCs for transportation established in the MMP.

#### **4.2.11.2. Assumptions**

- The transportation network will continue to be utilized in various degrees by recreation users, non-Federal landowners, and administrators regardless of presence of livestock operations.
- Recreational motorized vehicle-use in the Monument would gradually increase, based on current and anticipated trends in use and population growth.

#### **4.2.11.3. How Activities Affect Travel and Transportation**

##### ***Livestock Grazing Management Actions***

Livestock operators use the existing route network for a variety of livestock management activities such as trailing livestock, hauling water, moving sheep camps, and maintaining existing facilities. Maintained routes are used more frequently as primary access in and out of use areas; however, two-tracks or primitive routes are also used to move sheep camps and distribute livestock across the range.

#### **4.2.11.4. Discussion of Impacts by Alternative**

##### **Transportation: Alternative A**

##### ***Livestock Grazing Management Actions***

Under Alternative A, there would be no change in livestock management. Permittees would continue to conduct grazing operations on the existing road network and to trail livestock along road corridors. This would result in a direct, long-term, minor effect on access roads, and periodic maintenance would be necessary to retain existing route conditions. Under full permitted use, there would be an increase in route use associated with the increase in AUMs used by livestock operations. This increase in use would have a direct, long-term, minor to moderate effect on access roads, which will require periodic maintenance to maintain road conditions.

##### **Transportation: Alternative B**

##### ***Livestock Grazing Management Actions***

This alternative would result in a decrease in use on the routes that are within, or provide access to, the Little Park kipuka, North Pasture of Laidlaw Park Allotment, Larkspur Park kipuka, North Pasture of Bowl Crater Allotment, and Park Field kipuka. Access to the Little Park kipuka and the North Pasture of Laidlaw Park Allotment is a maintained county road that would continue to be

used by other visitors. Access to the Larkspur Park kipuka involves approximately 3 miles of primitive road from the Brigham Point road, which is a maintained road. Access to the North Pasture of Bowl Crater Allotment is approximately 4 miles of primitive road. Access to Park Field kipuka involves access by 7 miles of primitive road from Highway 24 and approximately 8 miles of primitive road from the Arco-Minidoka Road. This reduction in use would be a direct long-term, negligible to minor impact to transportation. Over time some of these primitive routes that provided access for grazing management could see a reduction in use such that they could become naturally re-vegetated. If recreational OHV use on routes diminishes or is minimal enough, natural re-vegetation of the road bed is possible. It is also possible that vegetation regrowth could pose a fire threat as an infrequent vehicle passes over the vegetation and traps it in the undercarriage. This natural re-vegetation would have an indirect, long-term minor to moderate impact to the transportation network.

In all other areas in the Monument where grazing still occurs, impacts will be the same as Alternative A.

In sage-grouse nesting or early brood-rearing habitats, routes would be restricted from March 15 to June 15. This would have a direct, short-term, minor impact to access for grazing operators, recreation visitors, and other users.

#### **Transportation: Alternative C**

##### ***Livestock Grazing Management Actions***

Impacts under Alternative C would be the same as impacts identified under Alternative A.

In sage-grouse nesting or early brood-rearing habitats, routes would be restricted from March 15 to June 15. This would have a direct, short-term, minor impact to access for grazing operators, recreation visitors, and other users.

#### **Transportation: Alternative D**

##### ***Livestock Grazing Management Actions***

The removal of grazing operations within the Monument would result in a direct, long-term moderate to major reduction of motorized use of the transportation network. It is important to note that grazing administration accounts for most of the transportation use in the Monument and is very low. Over time some of the unmaintained routes that provided access for grazing could see a reduction in use such that they could become naturally reclaimed, or re-vegetated. If recreational OHV use on routes diminishes or is minimal enough, natural re-vegetation is possible. It is also possible that vegetation regrowth could pose a fire threat as an infrequent vehicle passes over the vegetation and traps it in the undercarriage. This natural re-vegetation would have an indirect, long-term, minor to moderate impact to the transportation network. Many of the roads that receive regular maintenance may require less maintenance in the long term due to less use in the spring when wet roads are susceptible to damage resulting in a direct, moderate impact.

#### **Transportation: Alternative E**

##### ***Livestock Grazing Management Actions***

Impacts under Alternative E would be the same as impacts identified under Alternative A and C.

In sage-grouse nesting or early brood-rearing habitats, routes would be restricted from March 15 to June 15. This would have a direct, short-term, minor impact to access for grazing operators, recreation visitors, and other users.

## **4.2.12. Recreation and Visitor Experience**

Although management actions of this plan amendment apply only to BLM-managed lands, recreation opportunities within the Monument also occur on NPS-managed lands and a small amount of dispersed sections of State-administered lands. In the past 10 years, there have been a few informal complaints of user conflicts between recreation visitors and livestock operations.

Visitor use is very low in the expanded Monument because the area is in a remote location, and many of the same recreation opportunities are available in more convenient locations. Recreational visits to the BLM Monument are often for a specific purpose. Recreational activities in the expanded part of the Monument, in order of popularity, include hunting; driving for pleasure; geologic exploration including caving, lava hiking, and sightseeing; hiking; primitive camping; photography; horseback riding; and mountain biking.

### **4.2.12.1. Summary**

No management actions are proposed in this plan amendment for recreation.

Livestock operations may, at times, interfere with some recreational activities, such as driving for pleasure, hunting, solitude, or sightseeing; however, some visitors enjoy observing sheep-herding or cattle-driving. Under Alternatives A, B, C, and E, livestock operations would still exist to varying degrees within the Monument. Alternatives B and E would provide for the absence and reduction of livestock grazing in certain areas which would have an overall minor to moderate impact on recreational visitors. Overall, the impacts from all alternatives would be negligible to minor.

Under Alternative D, the removal of all grazing operations would eliminate possible user conflicts with recreational visitors and greatly reduce the potential for observations of livestock operations.

The DFC for recreation established in the MMP will be met under all alternatives.

### **4.2.12.2. Assumptions**

The method of analysis used to evaluate effects on recreation within the planning area was based on field observations and professional knowledge.

The following assumptions were made when analyzing the effects on recreation.

- Current recreational opportunities within the Monument would continue as described in the 2007 MMP.
- Educating the public on how to act when encountering livestock operations can reduce the likelihood of potential conflicts.
- Idaho Department of Fish and Game will continue to allow hunting of sage-grouse and big game in Idaho and the Monument.

### **4.2.12.3. How Activities Affect Recreation and Visitor Experience**

#### ***Vegetation Resources Management Actions***

A healthy vegetative ecosystem enhances the overall experience when visiting the Monument. Viewsheds with sagebrush and other native vegetation are photographed and studied within the Monument. Healthy sagebrush and native vegetation communities are aspects to the preferred setting for desired recreation opportunities.

#### ***Wildlife and Fish Resources Management Actions***

Wildlife within the Monument provides for certain recreation opportunities such as hunting and wildlife viewing. Healthy, productive wildlife populations would enhance those recreation opportunities. Management actions taken to limit visitors to certain areas for priority species during certain times would create use conflict only in those restricted areas and times.

#### ***Livestock Grazing Management Actions***

The presence of cattle and sheep and their attendant facilities and equipment from livestock operations can interfere with many types of recreational experiences such as driving for pleasure (cars and OHVs), hunting, solitude, or sightseeing. However, livestock operations and the concept of “open range” appeals to some Monument visitors. In the past 10 years there have only been a few informal complaints of use/user conflicts with livestock operations in the Monument.

### **4.2.12.4. Discussion of Impacts by Alternative**

#### **Recreation: Alternative A**

#### ***Wildlife and Fish Resources Management Actions***

Actions taken to benefit wildlife populations would enhance hunting and wildlife viewing opportunities within the Monument by promoting population growth. This would have an indirect, long-term, minor to moderate impact on these recreation activities. There could also be impacts on recreational visitors when seasonal restrictions are in place for priority species by restricting travel. However, the amount of recreational visitation during the restriction period of 6:00 PM to 9:00 AM, March 15 through June 15, would be low enough that it would result in negligible impacts. This is true under all alternatives.

#### ***Livestock Grazing Management Actions***

This proposal allows those recreation opportunities identified in the 2007 MMP to continue to be available. Under Alternative A, the impacts on recreation will stay consistent with the analysis done for the 2007 MMP. For instance, continued livestock operations would result in the presence of cattle and sheep and their attendant facilities and equipment. This could interfere with many types of recreational experiences, causing long-term, minor to moderate, impacts on these experiences, particularly during spring and fall months in locations where livestock operations and recreation activities occur in the same area at the same time. The presence of livestock disturbances along roadways, trails, and heavily visited areas are direct effects from livestock operations to the recreation visitor. As identified in the 2007 MMP EIS, livestock operations pose a health and safety concern for Monument visitors. For example, large sheep-guarding dogs are not human-friendly and may have little or no experience with humans or being treated as pets.

Often, these dogs are left alone to tend a sheep band, and their only duty is to chase off or kill anything they deem to be a threat to the sheep. Visitors are advised to avoid these dogs and to prevent their pets from venturing near sheep-guarding dogs and the sheep. These use-conflict interactions have various degrees of impact on visitors' experiences. Through a partnership with the Idaho Rangeland Resource Commission and various awareness campaigns, the BLM uses education as a means to mitigate such use conflicts with recreation visitors and grazing operations.

Given the long cultural history of livestock operations on public lands, some opportunities for recreational experiences related to seeing and appreciating sheepherding, cattle driving, and other activities would be possible, creating long-term, negligible to minor effects.

## **Recreation: Alternative B**

### ***Vegetation Resources Management Actions***

The recovery of sagebrush and other native vegetation would return vegetation to a more natural, healthy state contributing to improved photography, nature study, and other experiences. Healthy sagebrush and native vegetation communities are aspects to the preferred setting for desired recreation opportunities. This would result in indirect, long-term, negligible to minor impacts.

### ***Livestock Grazing Management Actions***

Under Alternative B, visitors could notice the removal of grazing infrastructure, equipment, and livestock within the Little Park kipuka, North Pasture of Laidlaw Park Allotment, Larkspur Park kipuka, North Pasture of Bowl Crater Allotment, and Park Field kipuka. Range improvement removal in these areas would result in an indirect, negligible to minor impact to the recreational experiences. The same impact would result from any removal of other livestock developments that were identified for removal in other areas. With all other areas that continue to have grazing, impacts will be consistent to Alternative A.

## **Recreation: Alternative C**

### ***Vegetation Resources Management Actions***

Impacts would be the same as described for Alternative B.

### ***Livestock Grazing Management Actions***

Overall, the changes in grazing between Alternative A and Alternative C would not result in any measurable differences in impacts to recreation opportunities and visitors. This alternative would have the same impacts as Alternative A.

## **Recreation: Alternative D**

### ***Livestock Grazing Management Actions***

Under this alternative, recreation visitors would not experience any interactions with livestock operations, livestock, or associated infrastructure on BLM lands within the Monument. Visitors to the Monument would no longer come across livestock herds and guard dogs along roadways, or elsewhere. This would result in direct, short- and long-term impacts to the recreational visitor. When analyzing the small amount of recreation visitation with the amount of use from grazing operations, there would be a minor change in the amount of social encounters. Visitors would not observe livestock related infrastructure within the Monument, which would result in an indirect,

long-term impact. Some of the more longer-lasting impacts from grazing such as over-grazed areas and other disturbed sites would eventually become less noticeable to the recreational visitor. Visitors could observe additional fences around the boundary of the Monument which may result in negligible to minor impacts to the visitor experience. Opportunities to view livestock would no longer be present in the Monument. Visitors who seek livestock viewing opportunities would become displaced and would be required to travel outside of the Monument for those desired opportunities. In total, though, removal of livestock grazing would have a negligible to minor positive impact on recreation and the visitor experience.

### **Recreation: Alternative E**

#### ***Vegetation Resources Management Actions***

Impacts would be the same as described for Alternative A.

#### ***Livestock Grazing Management Actions***

Overall, the changes in grazing between Alternative A and Alternative E would not result in any measurable differences in impacts to recreation opportunities and visitors. This alternative would have the same impacts as Alternative A.

## **4.2.13. Socioeconomic Values**

### **4.2.13.1. Summary**

Under the various alternatives evaluated in this analysis, the economic impact of prospective changes in stocking rates are not proportional to the changes in AUMs. Because of reductions in expenses associated with operating on any given allotment, a specific percentage reduction in AUMs does not result in an equal percentage reduction in net revenues to the enterprise. In addition to reductions in operating costs, producers may also have the opportunity to realize revenues through selling excess livestock or increasing output by means of feeding them off-allotment. Because not all opportunities are open to all producers, the assumptions used in this analysis are not presumed to apply to all ranchers' circumstances. Rather, they represent a general overview that should be adjusted when applied to specific allotments or to the attributes of individual ranches' cattle or sheep operations.

The following tables summarize the estimated impacts of possible changes in AUMs under each alternative on the total net revenue of all ranching operations with permits for running livestock on Monument allotments, collectively. The analysis was completed using a partial budgeting approach rather than a whole-enterprise approach. This approach aids to evaluate economic changes of minor adjustments to the business plan as opposed to using a specified set of production practices over a specific period of time. For example, if changes in permitted Monument AUMs result in changes in head of livestock under a given operation, then fixed ranching costs will have to be distributed over a different number of animals. The BLM does not have access to each individual ranch's whole-operation financial documentation. Therefore, the type of analysis that is appropriate for this planning effort is partial-budget marginal analysis, which takes into consideration proposed changes in management and the estimated impacts that can be directly attributed to those changes. The level of complexity that would involve individual whole-enterprise budgets is beyond the scope of this analysis, but would be important

for individual ranchers to keep in mind as they evaluate the possible impacts of the alternatives on their own ranching enterprises.

The dollar figures shown in the tables are estimated annual figures. The impacts of changes over ten-year permit time spans are shown in detailed calculations included in Appendix I, *Socioeconomic Reference and Data Tables*.

**Table 4.5. Analysis of Impacts of Alternatives on Net Revenue from Cattle Operations**

Alternative	Approximate % Change in Average Annual Billed AUMs	Change in Total Cattle AUMs	Total Cattle AUMs	Estimated Annual Net Revenue	Estimated Annual Impact on Net Revenue	Estimated 10-year Impact on Net Revenue (3% discount rate)
A (No Action)	0%	0	5,023	\$372,661	\$0	\$0
B	-20%	-1,005	4,018	\$295,592	-\$77,069	-\$657,416
C	0% - 321%	0 to 11,076	5,023 to 16,099	\$372,661 -\$1,222,091	\$0 to \$849,430	\$0 to \$7,245,812
D	-100%	-5,023	0	\$55,954	-\$316,707	-\$2,701,579
E	0% - 164%	0 to 3,215	5,023 to 8,238	\$372,661 to \$619,225	\$0 to \$246,564	\$0 to \$2,103,225

As of the completion of this analysis, conditions in the cattle market had pushed sale prices of livestock upward by an unusual amount in a short time due to severe drought, severe winter storm herd losses in the Great Plains, and disease losses in competing livestock market populations. The estimated prices used are not expected to persist as market conditions adjust over time. The use of different assumptions would result in different numeric results.

**Table 4.6. Analysis of Impacts of Alternatives on Net Revenue from Sheep Operations**

Alternative	Approximate % Change in AUMs	Change in Total Sheep AUMs	Total Sheep AUMs	Estimated Annual Net Revenue	Estimated Annual Impact on Net Revenue	Estimated 10-year Impact on Net Revenue (3% discount rate)
A (No Action)	0%	0	6,768	\$2,442,927	\$0	\$0
B	-20%	-1,354	5,414	\$2,044,029	-\$398,897	-\$3,402,675
C	0% to 321%	0 to 14,925	6,768 to 21,693	\$2,442,927 to \$5,387,216	\$0 to \$3,484,603	\$0 to \$2,972,437
D	-100%	-6,768	0	\$448,307	-\$1,994,619	-\$17,014,505
E	0% to 164%	0 to 4,332	6,768 to 11,100	\$2,442,927 to \$4,006,573	\$0 to \$1,783,296	\$0 to \$15,211,874

## Environmental Justice

Demographic statistics for the area of analysis indicate that there is a higher than typical number of people living and working in the area who self-identify as Hispanic, in comparison with the Idaho as a whole. To the degree that reductions in AUMs translate into reductions in workforce, and to the degree that the affected workforce is made up of a disproportionately high number of people of Hispanic or Latino origins, it is possible that cutbacks in permitted AUMs could have a disproportionately negative impact on Hispanic workers and populations within the study area. Whether or not this disproportionate impact would actually be realized would depend on the



specific decisions made by affected ranchers in response to any reductions in AUMs, if permitted and utilized AUMs were indeed to be reduced.

#### **4.2.13.2. Assumptions and Indicators**

Evaluation of the estimated impacts for each of the alternatives was completed using the best available data. The most recent published data was used, but extrapolated data were used where the most recent published data were unacceptably out-of-date.

As of the completion of this analysis, conditions in the cattle market had pushed sale prices of livestock upward by an unusual amount in a short time. Rather than using prices that reflected the specific combination of unusual conditions that caused this spike in prices (severe drought, severe winter storm herd losses in the Great Plains, and disease losses in competing livestock market populations), the estimated prices used were based on averages derived from the most recent available enterprise budgets published by the University of Idaho Extension.

The data were evaluated under the following assumptions:

- Average range-grazed calf weight of 490 lbs.
- 10% of the calf crop is retained as replacement heifers
- Percentage of calves reaching market ranges between 90% (100% minus percentage lost to predation, disease, etc.)
- The grazing season ranges from 7 months, depending on the allotment
- Market price for calves is \$2.35 per pound
- Market price for cull cows is \$0.64 per pound
- Ranchers will sell mother cows which are in excess of permitted numbers (due to reduced AUMs) as 1100 lb. cull cows, and revenues from those sales will earn 2% interest
- All analyses were completed using the 15-year average billed number of AUMs
- No private pasture is available as a source of replacement forage
- All proportions of cattle to sheep ratios of AUMs allocated on the Monument were assumed to remain constant across alternatives
- Operating costs were derived from the published formula for calculating Federal grazing fees
- Federal grazing fee per AUM is \$1.69
- Sheep enterprises were assumed to experience average marginal losses of \$84.93 per AUM under current market conditions, based on University of Idaho Extension enterprise budget data for typical “feeder” and “fat” enterprises
- Total head of sheep were estimated using 0.2 Animal Units per ewe/lamb pair
- Costs of ownership/capital costs were not included in the analysis for either cattle or sheep
- BLM allotment AUMS are the limiting factor that sets maximum herd and flock sizes

- When there is a reduction in the number of herd or flock animals permitted on a given allotment, it is assumed that all excess animals will be sold, either internally from one allotment to another within an individual ranch enterprise as a “sale” between herds (if the ranch has access to another allotment with capacity for the additional animals) or externally to another ranch

#### **4.2.13.3. How Activities Affect Socioeconomic Values**

The socioeconomic impacts of changes in grazing management on the Craters of the Moon National Monument are complex and uncertain. The prospective future economic impacts of each alternative depend on several factors. These factors include conditions in the markets for beef, sheep, and associated products; conditions in markets for competing goods such as pork and chicken; changes in the local and regional agricultural economies; and changes in the local and regional non-agricultural economies. Economic impacts of possible changes in grazing management include both the direct effects on ranch operators and the indirect impacts that could occur within the affected ranches’ supply chains. Additional effects could be felt as affected ranchers adjust buying patterns in their personal lives in response to changes in income. Although the number of livestock grazed on the Monument represent a small percentage of grazed livestock in the region surrounding the study area, their economic importance to the ranches operating on the Monument must not be discounted.<sup>1</sup>

Potential social impacts of possible changes in grazing management include disruption of existing contemporary and traditional patterns of work and family life, alteration of relationships between members of the local communities affected, and impacts to community activities and commercial networks. The degree to which these possible effects might be felt in any given community within the study area would depend on the relative resilience and flexibility of relationships, social systems, and networks of various types within those communities. It is possible that in communities where traditions are based on long-standing cultural values rather than being primarily based on current economic activity within the livestock industry, adjustments within the ranching sector might have only a minimal impact on social and cultural relationships and activities within the community itself. It is often the case that ranchers remain active in the cattle or sheep business because of family traditions, personal values, and cultural history. These factors are recognized as having value to communities within the region surrounding the Monument.

#### **4.2.13.4. Discussion of Impacts by Alternative**

##### **Socioeconomic Values: Alternative A**

Under Alternative A, cattle operations would be expected to realize net revenues of approximately \$372,661, depending on forage availability, season of use, and output.

Should range conditions be unfavorable, calf weights are expected to be close to 430 lbs. at sale, resulting in relatively low revenues combined with higher costs of operation. Under favorable conditions, range-fed calf weights would be expected to reach approximately 530 lbs. at sale, generating higher revenue. On average, sale weight is expected to be approximately 490 lbs. In

<sup>1</sup>Based on farm receipts reported in the most recent available National Agricultural Statistics Service data, it is estimated that the 2012 sales of cattle, sheep, and goat-related products reached just over \$68,760,000 in the five county economic study area. The maximum total value contributed by grazing allotments on the Monument represents approximately 2.6% of all income derived from cattle, sheep, and goat operations in the five county region. In 2012, all farm earnings in the economic study area were reported at \$289,100,000. The estimated maximum value of livestock operations on the Monument comprise just over six tenths of one percent (0.00626%) of all farm income in the economic study area.

addition, if the grazing season is long, the total number of head is expected to be lower than would be the case if grazing were to concentrate the same number of AUMs into a shorter grazing season. A longer season of use for grazing also subjects the herd to higher losses to predators, weather events, and disease. This could result in a lower percentage of the calf crop reaching the market in fall. Total potential net revenue, therefore, will be higher when the grazing season on the Monument is shorter rather than longer.

Under Alternative A, sheep operations would be expected to realize net revenues of approximately \$2,442,927, assuming that 85% of birthed lambs make it to market.

#### **Socioeconomic Values: Alternative B**

Under Alternative B, the total available AUMs are expected to be reduced by approximately 20% from average actual use. It is assumed that permittees do not have access to alternative pastures as a replacement for reduced AUMs on the Monument. Because the BLM AUMs limit total herd size, animals for which there is no BLM forage available are assumed to be culled from the herd and sold. Estimated net revenue under this Alternative is \$295,592 per year, depending on calf weights, the length of the season of use, and the resulting herd size. It is estimated that the corresponding economic impacts on all permittees' combined net revenues would be losses totaling approximately \$77,069 per year. The total decrease under each possible scenario is slightly less than a 20% reduction in net revenue due to revenue expected to be obtained through the sale of cull cows.

Under Alternative B, sheep operations would be expected to realize net revenues of approximately \$2,044,029, assuming that 85% of birthed lambs make it to market. This would be an estimated decrease of \$398,897 in annual net revenue. Total expected revenue includes a modest annual return from selling excess ewes, either at market or internally between ranch-owned flocks.

#### **Socioeconomic Values: Alternative C**

Under C, the average annual available AUMs are expected to be reduced by approximately 1% from average actual use, although this is speculative due to unknown future range conditions. Under C, the average annual available AUMs for cattle are expected to range from average billed use to as high as the full permitted level, which would be approximately 16,099 AUMs. The actual future use is unspecified due to unknown future range conditions. Estimated net revenue under this Alternative ranges from \$372,661 to \$1,222,091 per year, depending on stocking rates, calf weights, the length of the season of use, and the resulting herd size. It is estimated that the corresponding economic impacts on all permittees' combined net revenues would range from no impact to an increase of approximately \$849,430 per year in net revenue in comparison with baseline conditions.

Under Alternative C, sheep operations would be expected to realize net revenues ranging from approximately \$2,442,927 to a high of \$5,387,216, assuming that 85% of birthed lambs make it to market. This would be an estimated increase of between \$0 and \$3,484,603 in annual net revenue, depending on the adaptive management strategy implemented in each grazing year.

#### **Socioeconomic Values: Alternative D**

Under the No Grazing Alternative, Alternative D, cattle and sheep ranchers again face the same constraints as under Alternative B. It is assumed that selling each herd in its entirety, either on the open market or within the ranch by internally "selling" the excess livestock from one operating

unit to another, would be the best or only available option across all Monument allotments. Estimated annual net revenue realized from the sale of cattle is \$55,954. This range is based on the assumption that income from cattle sold will be invested at a rate of return of 2%. Estimated total annual marginal losses for cattle under this alternative are approximately \$316,707.

Under Alternative D, sheep operations would be expected to realize net revenues of approximately \$448,307 assuming that 85% of birthed lambs make it to market. This would be an estimated marginal decrease of \$1,994,619 in annual net revenue.

### **Socioeconomic Values: Alternative E**

Under Alternative E, the total average available AUMs for cattle are expected to range from 5,023 to 8,238. Estimated net revenue under this Alternative is expected to range from approximately \$372,661 to \$619,225 per year, depending on stocking rates, calf weights, the length of the season of use, and the resulting herd size. It is estimated that the corresponding economic impacts on all permittees' combined net revenues would range from no impact to an increase of approximately \$246,564 per year in net revenue in comparison with baseline conditions.

Under Alternative E, sheep operations would be expected to realize estimated net revenues ranging from \$2,442,927 to \$4,006,573, assuming that 85% of birthed lambs make it to market. This would be an estimated increase of between \$0 and \$1,783,296 in annual net revenue.

## **4.2.14. Climate Change**

Methane emissions from enteric fermentation are the result of normal digestive processes in ruminant and non-ruminant livestock. Microbes in the animal digestive system breakdown food and emit non-energy methane as a by-product. More methane is produced in ruminant livestock than in other animals because of digestive activity in the large fore-stomach to break down grasses and other high-fiber feeds [Idaho Department of Environmental Quality (DEQ), 2008]. Livestock manure may also produce GHGs such as methane and nitrous oxide. When manure is handled as a solid or deposited on pasture, range, or paddock lands, it tends to decompose aerobically and produce little or no methane, although nitrous oxide emissions may occur [EPA, 2014b].

Methane emission rates from cattle vary widely and depend on many variables [Johnson & Johnson, 1995]; [DeRamus, Clement, Giampola, & Dickison, 2003]. Estimates for grazing cattle typically range from 80 – 101 kilograms of methane per year per animal [EPA, 2009] or 6.7 - 9.2 kilograms of methane per month. These figures were used to calculate approximate emissions from livestock for each alternative.

### **4.2.14.1. Summary**

Alternatives A and C would have a similar effect on GHG emissions in that they have similar levels of AUMs authorized. At full permitted use, these alternatives would produce between 7,558 and 7,637 metric tons (t) of carbon dioxide equivalent (CO<sub>2</sub>e) per year, which is approximately 0.03% of Idaho's annual GHG emissions, 0.004% of the annual U.S. GHG emissions from livestock, 0.0001% of the annual U.S. emissions of all greenhouse gases, and 0.00002% of the global emissions of all GHGs. There would be a negligible effect to climate change.

Alternatives B and E would have a reduced level of GHG emissions due to the reduced AUMs permitted. Overall, however, there would be a negligible effect to climate change.

Alternative D would have no GHG emissions produced and would have a negligible effect to climate change.

#### **4.2.14.2. Assumptions**

This analysis assumes a methane emission rate of 8 kilograms of methane per AUM. Assuming methane has a global warming potential 25 times that of carbon dioxide [EPA, 2013], each AUM results in 0.2 t of CO<sub>2</sub>e.

Overall, changes in rangeland carbon storage as a result of changes in grazing practices are likely to be small and difficult to predict. Therefore, this analysis will assume that changes in grazing practices in the Monument would not result in a significant change in total carbon storage.

#### **4.2.14.3. How Activities Affect Climate Change**

##### ***Water Resources and Vegetation Resources Management Actions***

Land uses and/or land management activities that increase the ability of vegetation and soil to sequester carbon can help mitigate the effects of climate change. Such activities include improving/restoring riparian and wetland areas, improving age class diversity, health, and resiliency of forests, mitigating the size and intensity of wildfires, and maintaining/improving livestock grazing management.

##### ***Livestock Grazing Management Actions***

Livestock grazing can affect rangeland carbon levels, through changes in plant community and changes in ecosystem processes, but the effects have been variable and inconsistent among the ecosystems studied [Schuman, Ingram, Stahl, Derner, Vance, & Morgan, 2009]. Some studies have found that grazing can result in increased carbon storage compared to no grazing, because of increased plant turnover and changes in plant species composition [Follett, Kimble, & Lal, 2001]. Many changes in rangeland carbon from different grazing practices do not result in substantial changes in total ecosystem carbon, but are redistributions of carbon, for example, from above-ground vegetation to root biomass [Derner & Schuman, 2007].

#### **4.2.14.4. Discussion of Impacts by Alternative**

##### **Climate Change : Alternative A**

Continuing to permit 38,187 AUMs for grazing use in Alternative A would result in methane emissions of 7,637 t of CO<sub>2</sub>e per year (Table 4.6). The 15-year average actual use in Alternative A produces 2,358 t of CO<sub>2</sub>e per year. Activities in Idaho accounted for 28.5 million metric tons (Mt) of CO<sub>2</sub>e emissions in 2011; U.S. emissions of GHGs from livestock totalled approximately 213 Mt of CO<sub>2</sub>e [EPA, 2014a]; U.S. emissions of all GHGs totalled 6.8 billion metric tons (Bt) of CO<sub>2</sub>e [EPA, 2014a]; global emissions of all GHGs totalled 43.8 Bt of CO<sub>2</sub>e [World Resources Institute, 2014]. Emissions under this alternative would represent 0.03% of Idaho's annual GHG emissions, 0.004% of the annual U.S. GHG emissions from livestock, 0.0001% of the annual U.S. emissions of all GHGs, and 0.00002% of the global emissions of all GHGs. There would be a negligible impact to climate change.

**Table 4.7. Analysis of Impacts of Alternatives on Greenhouse Gas Emissions from Livestock in the Monument**

Alternative	AUMs/Year	Metric Tons CO <sub>2</sub> /Year	% of Annual Idaho Greenhouse Gas Emissions	% of Annual U.S. Greenhouse Gas Emissions (Livestock)	% of Annual U.S. Greenhouse Gas Emissions	% of Global Greenhouse Gas Emissions
<b>Alternative A (actual - permitted)</b>	11,791 – 38,187	2,358 – 7,637	0.008 – 0.03	0.001 – 0.004	0.00004 – 0.0001	0.000005 – 0.00002
<b>Alternative B</b>	9,432	1,886	0.007	0.0009	0.00003	0.000004
<b>Alternative C</b>	37,792	7,558	0.03	0.004	0.0001	0.00002
<b>Alternative D</b>	0	0	0	0	0	0
<b>Alternative E</b>	19,338	3,848	0.0136	0.018	0.00006	0.000009

#### **Climate Change : Alternative B**

Reducing livestock grazing use to 9,432 AUMs would result in methane emissions of 1,886 t of CO<sub>2</sub>e per year. Emissions under this alternative would represent 0.007% of Idaho's annual GHG emissions, 0.0009% of the annual U.S. GHG emissions from livestock, 0.00003% of the annual U.S. emissions of all GHGs, and 0.000004% of the global emissions of all GHGs. There would be a negligible impact to climate change.

#### **Climate Change : Alternative C**

Permitting livestock grazing use at 37,792 AUMs would result in methane emissions of 7,558 t of CO<sub>2</sub>e per year. Emissions under this alternative would represent 0.03% of Idaho's annual GHG emissions, 0.004% of the annual U.S. GHG emissions from livestock, 0.0001% of the annual U.S. emissions of all GHGs, and 0.00002% of the global emissions of all GHGs. There would be a negligible impact to climate change.

#### **Climate Change : Alternative D**

Removing livestock use would result in no methane emissions from livestock grazing on the Monument. Methane emissions from livestock on some adjacent private and State lands would still be present within the Monument. There would be negligible impact to climate change.

#### **Climate Change : Alternative E**

Reducing livestock grazing use to 19,338 AUMs would result in methane emissions of 3,848 metric tons of CO<sub>2</sub>e per year. This emission would represent 0.018% of the annual U.S. GHG emissions from livestock, 0.00006% of the annual U.S. emissions of all GHGs, and 0.000009% of the global emissions of all GHGs. There would be a negligible impact to climate change.

### **4.3. Cumulative Effects**

Cumulative impacts result when the effects of an action are added to or interact with the combined effects of all other ongoing actions, in a particular place and within a particular time. While impacts can be differentiated as direct and indirect, short term and long term, cumulative impacts consider the compounding effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects of all activities on a particular resource, ecosystem or

human community, no matter what entity (Federal, non-Federal or private) is taking the action. The Cumulative Impacts section is organized to first provide a general description of regional influences. These are factors within and outside the planning area that, when considered with management actions identified in each alternative, would create either beneficial or adverse cumulative impacts that should be analyzed. This discussion is followed by analysis of cumulative impacts for each resource and resource use that had adverse impacts identified in the resource discussions under Environmental Consequences above.

In order to diminish redundancy and repetition, the Regional Influences discussion is designed to provide detailed information regarding issues that would affect a majority of the Planning Area's resources. Regional influences include noxious weeds and invasive plants, fire and fuels management, livestock grazing, and lands and realty actions. Following the Regional Influences general discussion is the cumulative impacts analysis, divided by resource, in the Planning Area. Each discussion begins with a regional description for that resource, followed by past and current trends, as well as future anticipated trends. Past and current trends describe the current status of the resource, as well as noteworthy events from the past that contributed to the current situation. Future anticipated trends discuss potential outcomes of current trends in the foreseeable future. Following the past, current and future trends section is a description of cumulative impacts for each alternative. This part of the analysis addresses the region-wide effect that proposed management could have on the resource being discussed.

### **Regional Influences**

To determine potential cumulative impacts, projects in the area surrounding the Monument were identified. The area of primary concern is composed of the five Idaho counties in which the Monument is located: Blaine, Butte, Lincoln, Minidoka, and Power Counties. Projects outside this five-county area, however, are also considered if they have the potential to affect resources with broad regional importance. Projects identified for the purposes of cumulative impact analyses are past actions, planned or actions that are currently being implemented, and reasonably foreseeable future plans or actions. These projects were considered regardless of what agency, organization, or person undertakes them. Projects included in the cumulative impact analysis may not affect all resources equally.

Cumulative impact analyses are presented in this document by resource topic. The projects that make up the cumulative impact scenario were analyzed in conjunction with the impacts of each alternative to determine if they would have any additive or interactive effects on a particular resource.

### ***Idaho Statewide Implementation Strategy for the National Fire Plan***

The Idaho Department of Lands (IDL), in conjunction with the BLM and other federal agencies, signed the Idaho Statewide Implementation strategy for the National Fire Plan. The implementation plan focuses on fire prevention and suppression, hazardous fuels reduction, restoration of fire-adapted ecosystems, and the promotion of community assistance in fire management [IDL, 2002].

### ***Livestock Grazing***

Eighteen grazing allotments extend into the Monument and four are completely within the boundary, for a total of 22 allotments. Much of the surrounding BLM and state lands have been grazed since the 1860s and will continue to be grazed.

### ***Wildfire***

Between 1970 and 2013, approximately 310,000 acres have burned in wildfires within the boundary of the Monument, primarily on BLM-administered lands. About two-thirds of this acreage has burned two or more times (Figure 3.4, “Fire Frequency in the Monument (1970–2015)”). Extensive acreages outside of and adjacent to the Monument have also burned and will continue to do so. Large tracts of sagebrush have been lost due to extensive wildfires, and fires continue to foster an environment for the persistence, dominance, and expansion of non-native annual grasses.

### ***Climate Change***

Indicators of climate change include temperature, precipitation, snow pack, stream flow, stream temperature, plant phenology, wildfire, and vegetation dynamics [Gills et al., 2010] all of which continue to change throughout Idaho. A recent study of meteorological data collected from 1968 to 2008 suggests a decrease in precipitation and an increase in temperature across the state [Sohrabi, Ryu, Abatzoglou, and Tracy, 2012]. Sohrabi et al. (2012) suggest that these trends will continue in the future.

### ***Weed Management***

Cooperative weed management activities exist among the counties, private landowners, and government agencies.

### ***Irrigated Agriculture***

Substantial portions of the privately owned lands adjacent to the Monument are irrigated for agricultural production. Irrigated lands directly adjoin the Monument in three primary areas: east of the Wapi Lava Field, in the vicinity of the City of Carey near the west end of the Monument, and north of the Monument near the City of Arco.

### ***Arco-Minidoka Road***

In its comprehensive plan, Blaine County stipulates that the Arco-Minidoka Road segment within its jurisdiction will continue to be maintained at its current level. Furthermore, the Blaine County Commissioners have specifically stated that this part of the road will be maintained in its current condition.

### ***Fire Management Direction Amendments (FMDA)***

In 2008, Idaho BLM amended 12 existing land use plans with direction to manage fire, fuels, and related vegetation through the FMDA. The planning area, which includes the Monument, is composed of public lands managed by the Burley, Shoshone, Upper Snake, and Pocatello Field Offices, which are parts of the Twin Falls and Idaho Falls BLM Districts. The plan amendment forms the foundation for district fire management plans and normal fire rehabilitation plans, and it provides guidance for fuels treatments and vegetation management.

### ***Upper Snake Field Office Resource Management Plan Revision***

In 2008, the Upper Snake Field Office began a revision of its Resource Management Plan/Management Framework Plans. Before a Draft RMP/EIS was released, the Upper Snake land use plans were amended by the Idaho/SW Montana Greater Sage-grouse Plan Amendment EIS/ROD, which provides guidance for 85% of its 1.8 million acres. Rather than continue that



revision effort, Upper Snake Field Office is currently developing a new approach to plan for the few remaining issues and areas not addressed by that plan amendment.

### ***U.S. Highway 93 (US 93) Realignment***

The Idaho Transportation Department (ITD) plans to realign and upgrade the segment of US 93 that passes through and along the northern boundary of the Monument.

### ***Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management***

The BLM will continue to assess all livestock use allotments in Idaho with the use of the Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. These Standards are designed to provide resource measures and guidance needed to ensure healthy, functional rangelands. Livestock use allotments are evaluated to determine if Standards are being met or if significant progress toward meeting them is being achieved. If Standards are not being met, the BLM is required to make changes that would help achieve these Standards in the future.

### ***Gateway West Transmission Line***

This project was jointly proposed by Rocky Mountain Power and Idaho Power to build and operate approximately 1,000 miles of new high-voltage transmission lines between the Windstar substation near Glenrock, Wyoming and the Hemingway substation near Melba, Idaho. It passes just south of the Monument boundary. The project would include approximately 150 miles of 230 kilovolt (kV) lines in Wyoming and approximately 850 miles of 500 kV lines in Wyoming and Idaho. The final Record of Decision for this segment was signed in November 2013.

### ***Craters of the Moon National Monument and Preserve Comprehensive Travel Plan***

A Travel Management Plan was completed in 2009, subsequent to the CRMO 2007 MMP. It provides for the management of a travel network capable of accommodating the transport of people and equipment in a way that is appropriate for the Craters of the Moon National Monument and Preserve, while protecting the objects of interest present in the Monument. The Travel Plan applies only to lands managed by the Bureau of Land Management.

### ***Programmatic Emergency Stabilization and Restoration Plan***

The Twin Falls District (TFD) Programmatic Emergency Stabilization and Rehabilitation Plan (PESRP) Environmental Assessment provides guidance for treatments, implementation, and monitoring related to burned areas following wildfires. This plan was signed in 2013, and includes all the BLM lands in Craters of the Moon National Monument and Preserve. Post-fire recovery objectives are defined in the plan for both emergency stabilization and rehabilitation actions, and are in conformance with the 2007 Craters MMP. Site-specific ES & BAR plans are completed within 21 days following the containment of a fire, and a DNA is completed to determine compliance with the PESRP. Typically, ES & BAR treatments are funded for three years.

### ***Big Desert and Minidoka Fuel Break Projects***

In an effort to preserve sagebrush communities from the threat of wildfire, both the Burley and Upper Snake River Field Offices have recently completed environmental assessments for the construction of fuel break projects within their field offices adjacent to the Monument.

### ***Idaho and Southwest Montana Sub-Regional Greater Sage-Grouse Land Use Plan Amendment and Environmental Impact Statement***

Based on ongoing threats to the sage-grouse and its habitat throughout the West, and the USFWS's schedule for making a decision whether to list the species under the ESA, the BLM and the U.S. Forest Service amended several land-use plans (LUPs) for lands that include sage-grouse habitat to incorporate consistent objectives and conservation measures into all relevant plans. This EIS amended the 2007 MMP as well.

### ***Secretarial Order No. 3336 Rangeland Fire Prevention, Management, and Restoration***

Secretarial Order No. 3336 sets forth enhanced policies and strategies for preventing and suppressing rangeland fire and for restoring sagebrush landscapes impacted by Fire across the West. It builds upon past experience and successes for addressing rangeland fire, and broader wildland fire prevention, suppression, and restoration efforts to ensure improved coordination with local, State, Tribal, and regional efforts to address the threat of rangeland fire at a landscape-level.

## **4.3.1. Cumulative Effects by Resource and Resource Use**

### **4.3.1.1. Soil Resources**

#### ***Region of Influence***

The area of analysis for cumulative effects on soils is defined as the Monument and a zone of approximately 50 miles extending out from the perimeter. This was considered to be the distance within which wind-blown weed seed dispersal, soil removal and deposition, or fire-related impacts would be most likely to affect vegetation resources in the Monument. This influence would be greatest on the west side of the Monument because of the prevailing wind patterns.

#### ***Past and Current Trends***

Past actions that have affected soils are anthropogenic disturbances, agricultural practices on lands surrounding the Monument, historic livestock grazing practices, and wildland fires and related suppression activities. Native vegetation was reduced or removed with these activities, allowing a potential increase in noxious and invasive species, or seeding of non-native perennial species in an attempt to increase livestock forage and stabilize soils. Soil loss and movement were the most notable effects of these past actions, and stabilization was a result of the seedings. Emergency stabilization following wildland fires continues to occur in areas determined to need soil stabilization. Livestock grazing also continues across the Monument, and outside of adjacent or partial allotments. This use can result in negligible to minor impacts through reduced vegetation cover, but can be mitigated through maintaining residual cover and proactive grazing management.

#### ***Future Anticipated Trends***

Wildland fires and rehabilitation treatments are anticipated to continue in and around the Monument. This may be related to climate change, if warmer, drier conditions are expressed. Although fires will result in short-term negligible to moderate impacts, treatments are also expected to continue to mitigate long-term impacts of soil erosion and movement. Current land uses in and around the Monument are anticipated to continue at roughly the same degree as in the past.

The Idaho/SW Montana Sage-grouse EIS has amended the existing Monument Management Plan. Which has affected soils by setting priorities and objectives for sage-grouse habitat to meet

conservation measures resulting from that EIS. These affects are anticipated to be similar to the objectives and goals outlined in the 2007 MMP as well as in this MMP Amendment.

## **Cumulative Effects**

### ***Soils: Alternatives A and C***

Cumulative impacts to soils from actions outside of the Monument and reasonably foreseeable in the Monument are anticipated to be long-term, negligible to minor adverse impacts, such as associated with continued variable levels of resource uses, and natural episodic events. This includes actions from lands both in and out of the Monument.

Vegetation cover loss correlates to an increased potential for soil loss, so the occurrence of wildland fires will continue to require emergency stabilization to facilitate vegetation establishment and recovery, when deemed necessary.

Standards would continue, and would be used to determine if livestock use is meeting pre-determined Standards, as related to soil health and integrity.

Climate change could cause a shift in vegetation cover amounts and the health of ecological systems, and could be either an increase or a decrease [Monahan & Fisichelli, 2014]. Climate change could facilitate warmer, drier summer conditions, which could facilitate increased wildland fire severity and frequency. Reductions in vegetation cover, whether through climate change, wildland fire, or herbivory, can increase the erosion potential of an area, whereas increase in vegetation cover or shifts in cover to more resilient and stable species can reduce erosion potential [Ecoregional Assessment Program, 2013].

### ***Soils: Alternative B & E***

Cumulative impacts to soils from actions outside of the Monument and reasonably foreseeable in the Monument are anticipated to be negligible and site specific in the Monument, and negligible to minor cumulative impacts from actions continuing on lands around the Monument. Impacts would be at a reduced level in Alternative B and E as compared to Alternatives A or C, as grazing use would be reduced in this alternative. However, this could affect the placement of fuel loading across the landscape, which may contribute to wildland fire expansion, which in turn may offset the reduced soil erosion potential observed from reduced grazing levels. Alternative E also places into effect no net gain of soil disturbing activities from infrastructure or rangeland improvements within the Monument.

### ***Soils: Alternative D***

Cumulative impacts to soils from reasonably foreseeable actions outside of and in the Monument are anticipated to be negligible to minor beneficial and site specific in the Monument, and negligible to minor from actions continuing on lands around the Monument, including potential increases in livestock use in portions of allotments outside of the Monument, but that span the boundary. Although livestock grazing in the Monument would be removed, as well as effects to the soil resource from that use, wildland fire could continue or increase in intensity and rate of spread due to conditions related to climate change and minimized vegetation reduction from herbivory.

### **4.3.1.2. Water Resources**

#### ***Region of Influence***

The region of influence for water resources encompasses the allotments that span the boundary of the Monument and surface waters in coinciding watersheds (IDEQ 6th field HUCs). This region of influence would account for any effects attributed to livestock grazing management in the Monument that could result in a change in surface water conditions or riparian-wetland functionality.

#### ***Past and Current Trends***

Livestock grazing is the dominant land use in the area, and almost all of the land area is managed for grazing. There are 98 grazing allotments that are contained fully or partially within the affected watersheds, and 22 allotments are analyzed in the direct and indirect effects. Within the region of influence, approximately 185 miles of stream have been listed by IDEQ as water quality limited/impaired, also known as (303)d streams, for combined biota/habitat bioassessments. Numerous playas have been modified to enhance stock watering.

Wildfires have caused disturbances within the watersheds, increasing the potential for overland flows, soil erosion, and increased stream sedimentation. When wildfires have burned and removed riparian vegetation, the compounding impacts such as increased stream temperatures, loss of water infiltration, decreased bank stability, and impaired aquatic species habitat have occurred. Approximately 50% of the area within the watersheds affected by this MMP Amendment region of influence burned from 1970 through the 2014 fire season; some of this area has burned multiple times. The total acreage burned within this region of influence over the same time-frame is about 2,486,700 acres.

#### ***Future Anticipated Trends***

Impacts on water resources from roads, agricultural practices, fuel breaks, wildfires, livestock grazing, and other surface-disturbing activities in and adjacent to the Monument are expected to continue and could result in elevated sediment and nutrient delivery to water bodies. Although most water resources are affected by historic and/or current livestock grazing, the majority of the region is federally managed. Reasonably foreseeable future livestock grazing management is expected to improve the condition of the riparian areas and watersheds at a minimum to make significant progress toward meeting Standards, with an overall objective of meeting Standards. Additional threats include wildfire and climate change, which could affect future vegetation composition and precipitation patterns, thereby altering the recharge to springs and seeps. Specifically, climate change could influence water resources by shifting the timing, duration, and amount of precipitation. Climate change may also affect the duration and frequency of wildfires. Low-to-moderate-intensity fires release nutrients into the water and hold long-term importance for land- and stream-form development; however, larger and more severe fires could result in the temporary loss of riparian vegetation and associated stream shading, thereby increasing water temperatures and accelerating sediment transport into stream systems [Ecoregional Assessment Program, 2013].

#### ***Cumulative Effects***

For all alternatives the impacts on water resources from past, current, and future anticipated trends, when considered with the impacts expected under each alternative, could result in

temporary and long-term cumulative impacts on water resources from surface-disturbing activities that increase nutrient and sediment delivery to waterbodies. Impacts on water resources would be greater in areas where livestock use and surface-disturbing activities increase. In addition, climate change could lead to warmer, drier summer conditions, which could facilitate increased wildland fire severity and frequency. Reductions in vegetation cover, whether through climate change, fire, or livestock grazing, could increase the erosion potential of an area, whereas increases or shifts in vegetation cover to more resilient and stable species could reduce erosion potential.

Uses and activities on BLM-managed lands would address water resource objectives by seeking to reduce erosion and sedimentation. Uses and activities would be managed to meet water quality standards on stream segments that are water quality limited. Playa resources would be addressed through managing for Standards. Managing toward the objective of meeting Standards and PFC would have long-term beneficial cumulative impacts on water resources.

#### ***Water Resources: Alternatives A and C***

Alternatives A and C are anticipated to result in long-term, beneficial cumulative impacts to water resources by managing toward the objectives of meeting Standards and PFC. Adverse impacts could occur from potential increases in livestock use and natural episodic events, such as wildfire. Management under Alternatives A and C would make less progress towards reference state conditions, but would still maintain or improve water resources to meet Standards and PFC.

#### ***Water Resources: Alternative B***

Alternative B would likely result in long-term, beneficial cumulative impacts to water resources because surface-disturbing activities related to livestock grazing in the planning area would be minimized or seasonally restricted. Although Alternative B could result in increased use of riparian-lentic areas during late summer; however, management under this alternative would seek to attain reference state conditions in riparian-lentic areas. Alternately, if livestock use shifted to areas outside the Monument, management under Alternative B could result in adverse cumulative effects to water resources outside the Monument. Similar to Alternative A, natural episodic events, such as wildfire, could result in adverse cumulative impacts.

#### ***Water Resources: Alternative D***

Alternative D would likely result in long-term, beneficial cumulative impacts to water resources because surface-disturbing activities related to livestock grazing would be removed from the planning area. Management under this alternative would also seek to attain reference state conditions in riparian-lentic areas. Similar to Alternative B, if livestock use shifted to areas outside the Monument, management under Alternative D could result in adverse cumulative effects to water resources outside the Monument. Similar to Alternative A, natural episodic events, such as wildfire, could result in adverse cumulative impacts.

#### ***Water Resources: Alternative E***

The cumulative effects of Alternative E are expected to be similar to Alternatives A and C, except a potential increase in livestock use would not occur. .

### **4.3.1.3. Vegetation Resources**

#### ***Region of Influence***

The area of analysis for cumulative effects on vegetation is defined as the Monument and a zone of approximately 50 miles radius extending out from the perimeter. This was considered to be the distance within which wind-blown weed seed dispersal, soil removal and deposition, or fire-related impacts would be most likely to affect vegetation resources in the Monument. This influence would be greatest on the west side of the Monument because of the prevailing wind patterns.

### ***Past and Current Trends***

Past actions that have affected vegetation in the area of analysis include anthropogenic disturbances, agricultural practices on lands surrounding the Monument, historic livestock grazing practices, and wildland fires and related suppression activities. These practices have impacted vegetation through the introduction of noxious weeds and invasive plant species, and may have caused shifts in vegetation composition beyond a given natural threshold and created a new ecological state. Vegetation manipulation has occurred across the Monument in the past, and continues to occur, in the form of projects intended to increase forage production, stabilize soils, reduce fuels, create greenstrips or fuel breaks, and restore native shrub, grasses, and forbs. These past land treatments have stabilized soils, established non-native and native vegetation, and reduced noxious and invasive plant species in areas of successful establishment. The Idaho/SW Montana Sage-grouse EIS/ROD has amended the existing MMP. This will affect vegetation by setting priorities and objectives for sage-grouse habitat to meet conservation measures outlined in that EIS. These affects are anticipated to be similar to the objectives and goals outlined in the 2007 MMP as well as in this Plan Amendment.

### ***Future Anticipated Trends***

Areas surrounding the Monument would continue to be used for various activities, including agriculture, development, travel and transportation planning and creation, livestock grazing, and recreation. These activities have changed vegetation composition and increased noxious weeds and invasive plant species in the past. Wildfires and rehabilitation treatments, as well as pro-active land treatments, have occurred across the Monument and surrounding areas. These projects strive to establish desirable grasses, forbs, and shrubs, increase ecological system resiliency, reduce wildland fire severity and spread, stabilize soils, and reduce noxious weeds and invasive plant species. They can have a negligible to major impact on the vegetation resources through the short-term removal of vegetation, potential for noxious weed and invasive annual plants establishment, and potential natural ecological condition shifts.

Current land uses in and around the Monument are anticipated to continue at roughly the same level as in the past. These uses are likely to continue to disperse noxious weeds and impact intact plant communities. Certain areas would be rehabilitated to better condition than currently in, but other areas would remain indefinitely disturbed.

### **Cumulative Effects**

#### ***Vegetation: Alternatives A and C***

Activities affecting vegetation outside of the Monument could negatively affect vegetation resources both in and outside the Monument. Noxious weed populations are established in areas surrounding the Monument, and are treated regularly, with the anticipation of long-term negligible to moderate impacts.

Livestock grazing would be managed to meet Standards as related to biotic health and integrity.

Climate change could cause a shift in vegetation cover amounts and the health of ecological systems, and could be either an increase or a decrease [Monahan & Fisichelli, 2014]. Climate change could facilitate warmer, drier summer conditions, which could facilitate increased wildland fire severity and frequency. Climate change, wildland fire, or herbivory can all cause reductions in vegetation cover. Land treatments, either following these disturbances or as proactive measures before effects are observed, could cause shifts to more resilient and stable species [Ecoregional Assessment Program, 2013].

#### ***Vegetation: Alternatives B and D***

Cumulative effects on vegetation from reasonably foreseeable actions outside of and in the Monument are anticipated to be negligible and site specific in the Monument, and negligible to minor cumulative impacts from actions continuing on lands around the Monument. Impacts would be at a reduced level in Alternative B as compared to Alternatives A or C, as grazing use would be reduced with this alternative. However, this could affect the placement of fuel loading across the landscape, which may contribute to wildland fire expansion, causing an immediate reduction in vegetation cover, a potential for establishment of noxious weeds and invasive plant species, and a possible shift in plant community composition. Impacts would be at a reduced level in Alternative D compared to Alternatives A and C because no grazing would be allowed in the Monument. However, although livestock grazing in the Monument would be removed, wildland fire could continue or increase in intensity and rate of spread due to conditions related to climate change and minimized vegetation reduction from herbivory.

#### ***Vegetation: Alternative E***

Within Alternative E cumulative effects on vegetation from reasonable foreseeable actions outside of and in the Monument are anticipated to be negligible and site specific within the Monument, or negligible to minor cumulative impacts from actions continuing on lands around the Monument.

Impacts would be at a reduced level compared to Alternative A & C and higher than alternative B & D from grazing utilization within the Monument. Alternative E would limit vegetation loss due to soil disturbing activities related to rangeland improvement or infrastructure by enforcing a no net gain disturbance management and limited areas that would have range improvement. These area are pre-existing developed areas within the Monument now or historically.

### **4.3.1.4. Wildlife and Fish, Including Special Status Species**

#### ***Region of Influence***

The region of influence for numerous wildlife species (e.g., resident amphibians and reptiles) encompasses the Monument and overlapping grazing allotments, but also considers coinciding watersheds (6th Field HUCs). The region of influence for bighorn sheep considers the IDFG bighorn sheep PMUs which occur within the spatial boundary of the Risk of Contact Tool (22 miles) relative to the Monument boundary. The region of influence for sage-grouse is defined as the Monument and surrounding areas within the Snake-Salmon Beaverhead population of sage-grouse. This large population extends from the Snake, Salmon, and Beaverhead watersheds into southwestern Montana. The region of influence for sage-grouse is considered to be the distance within which bird movements and dispersal (e.g., genetic connectivity) have been observed to occur and, thus, was selected to capture the potential influence of management activities in the planning area on the sage-grouse population. This area also provides meaningful

context and relevance for other large and/or highly mobile species (e.g., big game, raptors, and migratory birds) that could utilize sagebrush steppe habitats in the Monument.

### ***Past and Current Trends***

Sagebrush steppe communities historically occupied the majority of the analysis area. A decrease in these communities over the last century has resulted in disturbed and fragmented wildlife and fish habitats and corresponding declines in the abundance of wildlife and fish species that depend on these ecosystems to complete important life-cycle activities. Mammals, birds, amphibians, reptiles, fish, and invertebrates have been specifically impacted by the loss or conversion of upland and riparian-wetland habitats, wildfire, drought, introduction of exotic species, historic and current livestock grazing, increased roads and motorized vehicle use, recreational use, chemical treatments of lands from industrial, agricultural, and residential applications, degraded water quality, and disease outbreaks.

Habitat availability is a primary limiting factor for sagebrush-associated species in this region due to a combination of land use change and natural disturbances such as wildfire. The Snake River Plain has a long history of agricultural land uses, and the majority of highly productive lands have been converted to farmland, resulting in a sagebrush landscape that is drier and less productive than those of past eras [Manier et al., 2013]. In addition, the wildfire interval has become more frequent and, with the invasion of noxious species, has increased the risk of the native plant community shifting to a community dominated by annual grasses and other exotic species. This shift in the vegetation community decreases habitat structure and function and provides unsuitable forage and cover conditions for many sagebrush-associated animal species. Wildfires at lower elevations, including habitats in the planning area, have the greatest impact to the natural community; few of the sagebrush habitats within this area are undisturbed and many have altered understories that reduce the ability of the habitat to support sage-grouse. Specifically, approximately 747,900 acres (85%) of the grazing allotments affected by this MMP Amendment burned from 1970 through the 2013 fire season.

Sage-grouse were historically widespread throughout the Snake River Plain, but populations have undergone long-term declines, partly due to ongoing losses of habitat quality and quantity. Sage-grouse abundance declined by over half from 1965 to 2007. However, the Snake-Salmon Beaverhead population has fluctuated around 5,000 males since 1992 and was considered stable to increasing from 2007 to 2010 [Garton et al., 2011]. This population is considered to be at low risk of extirpation [USDI USFWS, 2013] with virtually no chance of declining below 500 individuals in the next 100 years [Garton et al., 2011]. Sage-grouse are common or uncommon, but not rare, and are usually widespread throughout the area [USDI USFWS, 2012], despite long-term declines in abundance.

### ***Future Anticipated Trends***

Future wildlife and fish trends in the analysis area are largely dependent on the maintenance of sagebrush steppe communities. The majority of sagebrush habitat in this region is federally managed, and current trends in the region indicate a higher future demand for multiple-use activities (e.g., energy development and transmission lines, motorized vehicle and other recreational uses), with potential corresponding impacts on wildlife and fish resources. It is anticipated that agricultural practices on private lands and permitted livestock grazing on federally managed lands will continue into the future at roughly the same level as current use (273,900 acres, or >99% of the planning area, is currently available to livestock grazing). Grazing management on BLM lands has steadily improved in recent decades and currently must conform



to Standards, which include wildlife and fish habitat requirements. Reasonably foreseeable future livestock grazing is expected to improve the condition of riparian areas and uplands at a minimum to make significant progress toward meeting Standards.

Additional threats include wildfire and climate change, which could affect future vegetation composition by shifting the timing, duration, and amount of precipitation. Climate change also may affect the duration and frequency of wildfires. Historically, moderate fire return intervals and low intensity fires allowed sagebrush to persist within recently burned areas and thus promoted the mixed composition of sagebrush communities. However, wildfires are becoming larger and more frequent, effectively reducing the habitat quality and quantity of sagebrush communities [Ecoregional Assessment Program, 2013]. Maintaining and improving sagebrush steppe communities to provide diverse, abundant, and high quality wildlife and fish habitats on public lands will largely depend on wildfire and weed management programs and successful upland and riparian habitat restoration and rehabilitation programs. Although overall trends toward habitat loss and fragmentation are likely to continue, especially in southern portions of the region where wildfire and weeds persist at higher levels, appropriate vegetation management, including fuel breaks, could substantially alleviate these threats on large parcels of public land.

Predicted climate change effects on local precipitation and temperature may also increase the occurrence of invasive animal species, insect outbreaks, and diseases such as West Nile virus (WNV) [Ecoregional Assessment Program, 2013]. Most notably, WNV has been identified in sage-grouse populations in Idaho and may result in persistent low-level mortality and possibly severe outbreaks, leading to local extinctions and/or regional population declines [Ecoregional Assessment Program, 2013]. The risk of WNV is expected to increase as temperatures increase and is likely related to the amount of available surface water associated with irrigated agriculture on private lands, as well as livestock tanks and ponds on public lands [Ecoregional Assessment Program, 2013]. Larger populations of sage-grouse, such as the Snake-Salmon Beaverhead population, may absorb the impacts if population growth is supported by quality habitat.

### **Cumulative Effects**

For all alternatives the impacts on wildlife and fish resources from past, current, and future anticipated trends, when considered with the impacts expected under each alternative, could generate temporary and long-term cumulative impacts on wildlife and fish resources from activities that result in the loss, modification, or degradation/improvement of habitat; the disturbance of individuals during sensitive time periods; or direct animal mortality. In addition, climate change could lead to warmer, drier summer conditions, which could facilitate increased wildland fire severity and frequency. Reductions in vegetation cover, whether through climate change, fire, or livestock grazing, could alter both the habitat quality and quantity of sagebrush communities.

Uses and activities on BLM-managed lands would address wildlife and fish resource objectives by seeking to reduce disturbances of both wildlife and fish and their habitats. For example, livestock grazing management must conform to Standards, which include wildlife and fish habitat requirements. Implementation of reasonably foreseeable conservation measures designed to protect sage-grouse habitat could also benefit wildlife and fish resources.

### ***Wildlife and Fish, including Special Status Species: Alternative A***

Alternative A is anticipated to result in long-term beneficial cumulative impacts to wildlife and fish resources because managing to meet Standards would be expected to improve or maintain

conditions for wildlife and fish resources. Although some regional influences on lands not administered by BLM would continue to impact wildlife, fish, and their habitats, the management prescriptions identified here and additionally those identified in the ARMPA are expected promote the conservation of wildlife and fish resources. In particular ARMPA would cumulatively influence this and other alternatives in this plan by markedly reducing threats to wildlife and fish resources in the region, particularly on BLM and USFS administered public lands. In particular, the Snake-Salmon Beaverhead population of sage-grouse is expected to benefit. The Snake-Salmon Beaverhead population of sage-grouse is relatively large and presently stable; however it does face threats from a variety of human and natural causes, primarily wildfire and weeds. Ongoing activities that could alleviate impacts of fire include vegetation management actions that reduce fuels, control noxious weeds, and improve wildlife habitat, such as the Big Desert and Minidoka fuel break projects. Moreover, future actions on public lands consistent with the implementation of ARMPA are expected to provide short-term and long-term benefits to further reduce these threats. This is concluded because management actions in ARMPA are developed to promote the sustainability and health of Greater sage-grouse populations, their habitats, as well as promote landscape level rangeland health. Greater sage-grouse are considered an umbrella species for other sagebrush associated species (Hanser and Knick, 2011); consequently, it is assumed that management which promotes the short-term and long-term benefits of sage-grouse would also provide short-term and long-term benefits to other sagebrush associate species. Because the Monument occurs within the sagebrush biome, many of the species present and affected by the plan are sagebrush associates. For a full analysis of the effects of the ARMPA, please refer to the ID/SW Montana Sage-Grouse EIS.

***Wildlife and Fish, including Special Status Species: Alternative B***

Alternative B is anticipated to result in long-term, beneficial cumulative impacts to wildlife and fish resources because structural range improvements and livestock use of wildlife habitats would be restricted in the planning area to a great extent. However, if livestock use shifted as a result of the AUM reductions in the planning area, management under Alternative B could result in adverse cumulative effects to wildlife and fish resources outside the Monument. Regional influences on lands not managed by BLM would still impact wildlife and fish and their habitats, and overall trends toward habitat loss and fragmentation are likely to continue from spread of invasive weeds, wildfire, large-scale infrastructure, and other threats in the region. However, due to the expected long-term improved condition of habitat quality in the planning area from livestock grazing management, especially in sensitive wildlife habitats, implementation of Alternative B could result in an overall cumulative benefit to wildlife resources. The influence to cumulative effects from ARMPA under Alternative B is expected to be similar to those described under Alternative A.

***Wildlife and Fish, including Special Status Species: Alternative C***

Alternative C is anticipated to result in long-term, beneficial cumulative impacts to wildlife and fish resources. Although livestock use could potentially increase from current levels, Alternative C includes actions that would enable management to meet conservation objectives for sage-grouse over the short and long term. Management under this alternative would provide increased implementation-level guidance that would increase protection of sagebrush habitats, compared to current management, but to a lesser extent than Alternatives B and D. The influence to cumulative effects from ARMPA under Alternative C is expected to be similar to those described under Alternative A.

***Wildlife and Fish, including Special Status Species: Alternative D***

Alternative D is anticipated to result in long-term, beneficial cumulative impacts to wildlife and fish resources because livestock grazing and associated infrastructure would be removed from the planning area. Similar to Alternative B, if livestock use shifted as a result of the AUM reductions in the planning area, management under Alternative D could result in adverse cumulative effects to wildlife and fish resources outside the Monument. Management under this alternative would also have limited ability to affect spread of weeds and wildfire, the major threats to sagebrush steppe communities in the region. The primary means of alleviating these major threats is through vegetation management, which is limited to certain areas and unlikely to approach the scope of the threats. Furthermore, if implementation of Alternative D would reduce livestock permittees' abilities to keep ranches maintained or profitable, they could be sold and developed, causing additional loss of habitat [Wilkins et al., 2003]. Ultimately, the effects of removing livestock grazing in sage-grouse habitats on a landscape scale are unknown, and it is unclear whether complete removal would improve sage-grouse habitat or increase population levels ([USDI USFWS, 2010] and references therein). The influence to cumulative effects from ARMPA under Alternative D is expected to be similar to those described under Alternative A.

Alternative D could result in a net increase in fence infrastructure to facilitate closing Monument lands to grazing. If fencing existing cattle allotments along the boundary is implemented it could cumulatively result in a net increase of approximately 27 miles of fence infrastructure. Cumulatively fence infrastructure representing a collision hazard to sage-grouse would also increase by 10.5 miles if this option is implemented.

If existing cattle and sheep allotments along the boundary are fenced to facilitate the closure then there could be a cumulative increase in fence infrastructure by 97 miles. Cumulatively fence infrastructure representing a collision hazard to sage-grouse would also increase by 34.5 miles if this option is implemented.

Cumulatively increasing fence infrastructure is expected to increase the risk of collision for sage-grouse and entanglement of big game. Adequately marking fences could minimize the risk of collision with sage-grouse. Also, building fences consistent with suggested practices to minimize big game conflicts could minimize adverse consequences with entanglement of big game. This may include adjusting spacing between wires, using a minimum number of wires, adjusting fence height, utilizing smooth wire, utilizing drop-down fences, or increasing visibility.

Alternative D could result in a net decrease in fence infrastructure If livestock management or existing fence infrastructure is used to close Monument lands to grazing. Cumulatively this option would result in a net decrease in fence infrastructure from the removal of 65 miles of existing fence infrastructure within the monument. Cumulatively this would remove 33 miles of fence that represents a collision hazard to sage-grouse.

### ***Wildlife and Fish, including Special Status Species: Alternative E***

Alternative E is anticipated to result in long-term, beneficial cumulative impacts to wildlife and fish resources because livestock use of wildlife habitats would be reduced in the planning area. Also impacts from structural range improvements could be reduced as well. These benefits would occur at a lesser extent relative to Alternative B, but would be greater relative to Alternatives A and C. However, if livestock use shifted as a result of the AUM reductions in the planning area, management under Alternative E could result in adverse cumulative effects to wildlife and fish resources outside the Monument. Regional influences on lands not managed by BLM would still impact wildlife and fish and their habitats, and overall trends toward habitat loss and fragmentation are likely to continue from spread of invasive weeds,

wildfire, large-scale infrastructure, and other threats in the region. However, due to the expected long-term improved condition of habitat quality in the planning area from livestock grazing management implementation of Alternative E could result in an overall cumulative benefit to wildlife resources. The influence to cumulative effects from ARMPA under Alternative E are expected to be similar to those described under Alternative A.

#### **4.3.1.5. Native American Rights and Interests**

##### ***Region of Influence***

The area of analysis for cumulative impacts to Native American Rights and Interests was defined as all the livestock grazing allotments within the Monument, as well as those allotments that extend outside the Monument because Plan Amendment actions would not affect Native American Values outside these allotments.

##### ***Past and Current Trends***

For many years, Monument allotment lands have been subject to a variety of uses and events that have affected cultural and ethnographic resources to various degrees. Historic livestock grazing and the associated water developments and roads/infrastructure construction have had an impact on native plants, wildlife, and cultural resources before the passage of FLPMA, NEPA, and the NHPA.

Wildfires have always occurred in the Monument and on the surrounding lands. Before modern fire fighting methods, fires would burn vast areas unchecked. The earliest post-fire restoration methods consisted of seeding crested wheatgrass on large tracts with a plow. The introduction of non-native plant species changed the vegetation communities dramatically in some areas.

Since the passage of FLPMA, NEPA, and the NHPA, the impacts to cultural resources from livestock developments, road construction, and post-fire restoration have been greatly reduced or mitigated by using the Section 106 process to avoid impacts to sites. The 2000 designation of the expanded Monument and the subsequent 2007 MMP and the 2009 Comprehensive Travel Plan provided even more protections for wildlife, native plants, and cultural resources from development within the Monument. Wildfires and restorations continue to occur, but modern suppression techniques and the use of rangeland drills for seeding have reduced the amount of soil disturbance. Native species are used in seed mixes where appropriate. Livestock numbers have fallen dramatically in recent years due to economic and environmental reasons as compared to historic numbers. Even the amount of illegal archaeological collection has fallen due to public awareness of preservation laws to protect sites. All of these factors have resulted in the preservation of Native American Rights and Interests.

##### ***Future Anticipated Trends***

Based on the trend over the past several years since the 2007 Plan was signed and the fact that no new major developments are proposed within the Monument, there would be little foreseeable change in Native American Rights and Interests. If climate change were to cause drought conditions more often, AUM levels might be further reduced due to changes in forage and wildfires could become more severe. It is difficult to speculate what long-term effect climate change could have to Native American Rights and Interests, but regardless, wildfires will continue to occur in the future. Given the low level of recreation use the Monument has seen since it's expansion, future increases in recreational use are not anticipated any time soon.

The final GRSG ARMPA now provides more restrictions on infrastructure development for the benefit of sage-grouse. Combined with all the aforementioned regional influences, the trend seems to be toward less wildlife, native plant, and cultural resource disturbance from human-caused factors, with the continued potential for impacts from climate change and wildfire.

### **Cumulative Effects**

#### ***Native American Rights and Interests Alternatives A-E***

Under Alternatives A, B, C and E, cumulative impacts to Native American Rights and Interests from actions outside the Monument boundary, plus those of the alternatives, would have long-term, negligible to minor impacts.

Cumulative impacts to Native American Rights and Interests in Alternative D from actions outside the Monument boundary, plus those of this alternative, would be long-term, negligible to minor improvement to Native American Rights and Interests.

### **4.3.1.6. Cultural Resources**

#### ***Region of Influence***

The area of analysis for cumulative impacts to Cultural Resources was defined as all the livestock grazing allotments within the Monument, as well as those allotments that extend outside the Monument because Plan Amendment actions would not affect cultural resources outside these allotments.

#### ***Past and Current Trends***

For many years, Monument allotment lands have been subject to a variety of uses and events that have affected cultural resources to various degrees. Historic livestock grazing and the associated water developments and roads/infrastructure construction have had an impact on cultural resources, as well as the thousands of sheep that grazed here in the pre-WW II years. Many sites associated with playas were damaged or destroyed by the excavation of water catchments for livestock before the passage of FLPMA, NEPA, and the NHPA.

Wildfires have always occurred in the Monument and on the surrounding lands. Before modern fire fighting methods, fires would burn vast areas unchecked. The earliest post-fire restoration methods consisted of seeding crested wheatgrass on large tracts with a plow. Plowing disturbs the soil much deeper than modern seed drills, resulting in more cultural resource disturbance. Often times, these projects were not subject to inventory and cultural resources were not avoided by the plows.

Since the passage of FLPMA, NEPA, and the NHPA, the impacts to cultural resources from livestock developments, road construction, and post-fire restoration have been greatly reduced or mitigated by using the Section 106 process to avoid impacts to sites. The 2000 designation of the expanded Monument and the subsequent 2007 MMP and the 2009 Comprehensive Travel Management Plan provided even more protections for cultural resources from development within the Monument. Wildfires and restorations continue to occur, but modern suppression techniques and the use of rangeland drills for seeding have reduced the amount of soil disturbance. Livestock numbers have fallen dramatically in recent years due to economic and environmental reasons as compared to historic numbers. Even the amount of illegal archaeological collection has fallen

due to public awareness of preservation laws to protect sites. All of these factors have resulted in more stable archaeological site surfaces.

### ***Future Anticipated Trends***

Based on the trend over the past several years since the 2007 Plan was signed and the fact that no new major developments are proposed within the Monument, there would be little foreseeable change in the stability of cultural resources. If climate change were to cause drought conditions more often, AUM levels might be further reduced due to reduced forage and wildfires could become more severe. It is difficult to speculate what long-term effect climate change could have to cultural resources, but regardless, wildfires will continue to occur in the future.

The final GRSG ARMPA now provides more restrictions on infrastructure development for the benefit of sage grouse, indirectly benefiting cultural resources as well. Combined with all the aforementioned regional influences, the trend seems to be toward less archaeological site disturbance from human-caused factors, but potentially increased impacts from wildfires due to climate change.

### **Cumulative Effects**

#### ***Cultural Resources: Alternative A-E***

Under Alternatives A and C, cumulative impacts to cultural resources from actions outside the Monument boundary, plus those of the alternatives, would be long-term, negligible to minor impacts.

Cumulative impacts to cultural resources in Alternative B, D and E from actions outside the Monument boundary, plus those of this alternative, would be long-term, minor improvement in site stability.

### **4.3.1.7. Visual Resources**

#### ***Region of Influence***

The region of influence used for the visual analysis is the planning area. The youngest and most geologically diverse section of basaltic lava terrain found on the Eastern Snake River Plain lies within the Monument boundary. These geological features along with expansive sagebrush steppe and grasslands, add to the visual diversity of a viewscape unique in North America. The Monument boundary has been adjusted and expanded several times since its inception to further protect and manage these unique visual resources.

#### ***Past and Current Trends***

Wildfires have played a large role in impacting the visual landscape in the Monument. Visual impacts include smoke, increased vehicle traffic, fire lines, and the contrast between burned and unburned areas. Burned areas can vary in size from a few acres to tens of thousands of acres. Another historic influence on the visual landscape is the occurrence of noxious weeds and invasive plant species.

#### ***Future Anticipated Trends***

With current and expected future drought conditions along with expected fires, there will continue to be disturbances to the visual landscape.

### **Cumulative Effects**

#### ***Visual Resources: All Alternatives***

The cumulative impacts on visual resources from actions inside and outside the Monument, added to the effects of Alternatives A, B, C, and E would be minor to moderate, mainly due to fence marking. Alternative D may have a slightly higher impact to visual resources if additional fencing is built during implementation.

### **4.3.1.8. Wilderness Study Areas**

#### ***Region of Influence***

The region of influence for analysis is the boundaries of the four WSAs that are partially, or fully, within the Monument, as described in Chapter 3. As effects of livestock grazing and other uses described in this plan may only occur within a certain allotment boundary or in isolated areas within the Monument, any impacts to WSA acres could impact their suitability as whole, whether that be a reduction or enhancement of wilderness characteristics.

#### ***Past and Current Trends***

Since their designation, the Monument's WSAs have seen very little change in their wilderness characteristics. The major threats to their suitability are wildfires, noxious weeds and invasive plant species, motorized cross country travel, and potential energy developments. Currently, there are no plans for Congress to make any decisions for designating or releasing the Monument's WSAs.

#### ***Future Anticipated Trends***

Only Congress has the authority to either designate WSAs as wilderness or release them from further study. If Congress decides to designate any WSA as wilderness, those lands will then be managed pursuant to the Wilderness Act. If Congress decides to release any WSAs from further study, these areas will no longer be subject to BLM's WSA policy and will be managed under general BLM management authorities.

### **Cumulative Effects**

#### ***Wilderness Study Areas: Alternative A-E***

The management actions in these alternatives along with projects outline above will not produce an aggregate negative effect upon the wilderness characteristics and values that would constrain Congress's decision to designate the areas as wilderness.

### **4.3.1.9. Lands with Wilderness Characteristics**

#### ***Region of Influence***

The region of influence for this analysis is the total area of units where wilderness characteristics were present during inventory for this MMP Amendment. See Figure 3.16, "Inventory for Lands

with Wilderness Characteristics Map” for a map of inventory units. While most of the units lie within the Monument boundary, there are some that extend beyond the Monument boundary. This is a result of the unit boundaries being established based on route analyses per guidance found in BLM Manual 6310.

### ***Past and Current Trends***

Since the initial inventories conducted in the 1980s, the Shoshone Field Office has not maintained an ongoing inventory of wilderness characteristics within the Monument. There has been some inventory conducted in isolated areas in the Monument for various other projects since the new direction on lands with wilderness characteristics was released in 2012.

### ***Future Anticipated Trends***

The inventories for lands with wilderness characteristics will continue to be maintained and updated as necessary in land use planning efforts. The presence of the Monument precludes the threat of future large-scale developments which could impact the current lands with wilderness characteristics.

### **Cumulative Effects**

#### ***Lands with Wilderness Characteristics: Alternative A-E***

The management actions in these alternatives along with projects outlined above, will not produce an aggregate effect upon the wilderness characteristics and values. Also the presence of lands with wilderness characteristics will not change, or prevent change of the management or use of public lands proposed in each alternative.

### **4.3.1.10. Livestock Grazing**

#### ***Region of Influence***

The area of analysis for cumulative effects on livestock grazing is the area encompassed by those allotments that lie either wholly or partially within the Monument boundary because any decision affecting the Monument would likely require an adjustment in the management of the remainder of those allotments. Many livestock operations in the Monument also rely on forage produced on other federal, state and private lands within the region, and decisions affecting forage availability on those lands would influence the importance of access to available forage within the planning area. However, while it would be reasonable to assume that actions that affect forage availability within the planning area would have an indirect effect upon the need for forage in these other areas, the complexity of these effects make any analysis of these effects purely speculative.

### ***Past and Current Trends***

From early settlement to 1945, public lands in the State of Idaho were managed by the General Land Office (GLO) in coordination with the Grazing Service. Under that management, public lands were categorized as arid, broken, mountainous, or grazing. Many settlers depended on public lands to supplement their livestock operations. Local ranchers grazed the public lands in conjunction with their private ranch lands on a first-come, first-served basis. Livestock migrated from the southern end of the Shoshone Field Office (Magic Valley and Snake River Plains) to the north (Wood River Valley, Camas Prairie, and Stanley Basin) or towards eastern Idaho in the



spring and summer and back again in the fall, north to south. All livestock were herded to grazing locations in the late 1800s and through the mid-1900s.

The Grazing Service dealt mainly with grazing policy and the GLO managed settlement, land sales, land exchanges and mineral rights; however, there were some redundancies between the two agencies. Due to the considerable costs of World War II, Department of the Interior (DOI) officials sought a way to combine the two agencies. In 1946, the DOI formed the BLM and grazing on public lands was formalized and regulated. During this time, the BLM began managing public grazing lands by dividing areas into grazing allotments. Livestock were herded or “trailed,” moving between private lands, state leases, and federal grazing permits (BLM and U.S. Forest Service), whereby grazers or permittees were assigned to specific allotments.

The Monument has had sheep use, and to a lesser extent cattle use, since the 1860s. Prior to World War II, the historic livestock use and sheep numbers in Idaho were substantially higher than they are today. In the early 1900s, there were numerous reports in the Great Basin of being able to count the sheep bands on the mountains by the dust clouds, and that little forage was available for any of them [Box & Malechek, 1987]. The Shoshone Field Office started to encounter numerous requests for sheep use conversions to cattle use in the late 1970s and early 1980s, and this trend continued into the early 1990s as producers shifted their interests. In addition, wildlife management was aimed at reducing competition for the scarce forage and elimination of predators, such as wolves and coyotes.

There have been many structural and non-structural range improvement projects established throughout the 22 allotments in the planning area. Structural range improvement projects include fences, cattle guards, riparian exclosures, reservoirs, water gap structures and pipelines with associated water troughs to help facilitate livestock grazing management in allotments. These projects became necessary infrastructures as rangeland management grazing systems and livestock conversions from sheep to cattle were implemented and structural projects continue to be analyzed and implemented today. Non-structural improvements have included vegetation treatments such as brush control, weed control, and seeding.

In addition, the BLM has developed a national strategy to preserve, conserve, and restore sagebrush habitat, the ecological home of the sage-grouse. The BLM issued national policy and direction, based on local needs and information, to guide the agency’s actions and raise the importance of sagebrush conservation in BLM planning efforts. The decisions resulting from the ID/SW Montana Sage-grouse EIS addressed sage-grouse issues and the impacts of amending all pertinent RMPs, including that for the Craters of the Moon National Monument and Preserve, to reflect new conservation measures, including the land use plans under which the planning area is managed. The Record of Decision, amended the 2007 Craters MMP to include the new management direction. This planning effort resulted in plan-level guidance that will be used to direct future on-the-ground projects and is detailed in the Idaho and Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment.

New conservation measures for sage-grouse were formalized in the plan amendment, and impacts to livestock grazing have occurred as a result of the new management direction. Some reasonably foreseeable changes include modifications to permitted livestock use and management changes to the allotments where Standards are not being met. Such changes could also be dependent on natural factors, including wildfires and drought.

### ***Future Anticipated Trends***

The Burley, Shoshone, and Upper Snake Field Offices and permittees will continue to provide maintenance of all structural range improvements (fences, reservoirs, pipelines, guzzlers, corrals, cattle guards, and spring developments and troughs), road maintenance, and cattle guard or spring box replacement where warranted and allowed. New structural projects such as cattle guards, management fences, and water developments will continue to be proposed and analyzed to help promote or maintain progress toward Standards and support guidelines for livestock grazing management. Ongoing Emergency Stabilization and Burned Area Rehabilitation projects and monitoring throughout the Monument area in conjunction with wildfires occurs continuously.

Future changes to livestock grazing in the Monument are likely, as both the BLM's and operators' management shift over time, based on resource considerations and business needs. Some reasonably foreseeable scenarios that may change livestock grazing for the operators are changes in permitted use, changes to which allotments they are permitted in, and changes in private land ownership through sale or leases. Reasonably foreseeable scenarios that may change livestock grazing from a land management perspective include wildfires, flood, seasonal weather such as extreme temperatures and wet springs, or changes that may need to occur due to monitoring and data collection.

Cumulative effects upon livestock grazing under all alternatives are most likely to stem from those regional influences that limit, reduce, or prohibit livestock grazing or AUMs in the planning area. Actions that degrade rangeland health and forage production, or that restrict areas open to grazing, the season of use, timing, or the ability to construct and maintain range improvements would result in impacts that make livestock grazing more difficult to manage.

Within the Monument, vegetation communities are influenced by livestock grazing management, wildfires, rehabilitation efforts, fuel break projects, and climate. All activities that affect vegetation communities indirectly affect livestock grazing. These influences all interact to affect changes in the vegetation communities, and thus the forage base for livestock grazing.

While current livestock management strives to maintain and enhance rangeland health, historically unregulated livestock grazing contributed to the current abundance cheatgrass. The abundance of cheatgrass contributes to the size, severity, continuity, and frequency of wildfires in a feedback loop. In an attempt to disrupt this loop, rehabilitation efforts following wildfires are designed to establish more fire resistant and resilient species that can reduce the abundance of cheatgrass. The Programmatic Emergency Stabilization and Restoration Plan directs treatments following wildfires. These treatments often result in changes in plant communities, including establishment of perennial grasses, forbs, and shrubs that were often absent prior to the wildfire. Fuel breaks are a change in the vegetation community in small, narrow strips, such as along roads, in an attempt to prevent large wildfires. Predictions of warmer, drier climate will affect vegetation communities and wildfires alike.

Some of these influences can also result in a temporary reduction in available forage, close areas to grazing, restrict grazing management, or increase the forage base. Establishment of perennial grasses and forbs in areas that were previously dominated by cheatgrass would increase the available forage, causing shifts in grazing patterns without changing AUM allocations. After wildfires, burned areas are typically rested from livestock grazing, to allow the vegetation to recover. Areas treated under the ES and BAR plans are also rested from livestock grazing until seeded species are established and able to withstand grazing pressure.

## **Cumulative Effects**

***Livestock Grazing: Alternative A***

Cumulative effects under Alternative A would likely be most influenced by the Idaho and Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment, wildfires, and subsequent rehabilitation efforts. Specific goals and management actions have been identified to conserve sage-grouse habitat or improve rangeland condition. This management direction will influence livestock grazing similarly to other actions that influence vegetation communities. All management actions in the EIS are designed to improve rangeland health, and therefore would prove beneficial to livestock grazing in the long term, though short-term effects may be reductions in forage allocation, areas available to grazing, seasonal restrictions, or limitations on grazing-related infrastructure. For a full analysis of the effects of the Approved Resource Management Plan Amendment, please refer to the ID/SW Montana Sage-Grouse EIS.

***Livestock Grazing: Alternatives B, C, and E***

Cumulative impacts to Alternatives B, C, and E are similar to those of Alternative A, though to varying degrees, as related to the restrictions placed on grazing in each alternative. Under Alternatives B and E, the closure of some areas to livestock grazing and the reductions of available AUMs in the planning area would likely displace livestock grazing into areas outside the Monument. Concentrating livestock use in areas that are managed through other LUPs would cumulatively result in more difficulty in managing those areas to meet Standards.

***Livestock Grazing: Alternative D***

The implementation decisions that would be required if this alternative were selected would not be considered to have cumulative impacts upon livestock grazing. Yet, when coupled with the Idaho and Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment, cumulative impacts could occur upon those areas of allotments that lie outside the Monument. Allotments that span the Monument boundary would likely see shifts in use patterns and may need adjustments in management as a result, since no grazing would be allowed inside the Monument. Additional management actions brought about by the Sage-Grouse Amendment would be likely affect livestock grazing or AUMs in those areas. Changes in livestock use from livestock grazing being excluded from the Monument, compounded with increased limitations and barriers to livestock management could cause major, long-term, negative impacts to livestock grazing.

**4.3.1.11. Travel and Transportation*****Region of Influence***

The region of influence for the transportation analysis is the Monument boundary. This region of influence was chosen to reflect the Craters of the Moon National Monument and Preserve Comprehensive Travel Management Plan (Travel Plan) which uses the Monument boundary.

***Past and Current Trends***

Over the past 15 years, the actual use of allotments is much lower than the permitted use. While some routes have been upgraded and maintained since the 2007 MMP and 2009 TMP, there has been no need for an increase in routes for livestock grazing. With the implementation of the Travel Plan, there has actually been a net decrease in routes within the Monument.

### ***Future Anticipated Trends***

With expected slow growth in regional visitation, combined with potential increases in Monument visitations described in the MMP, there could be a gradual increase in visitation within the Monument which would result in more use of the transportation network. It is projected that transportation and access needs for livestock grazing will not increase throughout the life of this plan.

### **Cumulative Effects**

#### ***Transportation: Alternative A, B, C, and E***

Distribution of the recently developed travel maps in nearby communities may attract more visitors to the Monument. Since the 2007 MMP and 2009 TMP, there have been road improvements in the Monument, reducing travel time for travelers and fire engines. Increased efforts in providing updated travel information at kiosks located at the Monument's access points could increase the amount of compliance for cross-country travel and seasonal restrictions for sage-grouse. Overall, the effects of these actions, along with the effects of actions in Alternatives A, B, C and E, would result in long-term, minor to moderate changes to transportation patterns.

#### ***Transportation: Alternative D***

In addition to the cumulative impacts for Alternatives A, B and C, Alternative D would result in long-term, moderate to major reduction of motorized use of the transportation network due to the absence of livestock operation use.

## **4.3.1.12. Recreation and Visitor Experience**

### ***Region of Influence***

The region of influence for the recreation analysis is the Monument boundary. The unique geologic features and large expanses of sagebrush steppe and grasslands within the Monument provide unique and outstanding opportunities for achieving solitude during recreation opportunities. Recreation visitors to the BLM portions of the Monument seek these specific recreation opportunities.

### ***Past and Current Trends***

There is a difference in estimated Monument visitation numbers from the 2007 MMP and this analysis (estimated 20,000 visits in the 2007 MMP; 3,276 actual visitations in 2013). This difference is the result of more in-depth visitor use calculations using road counter data, data from Idaho Department of Fish and Game, and field monitoring. There is no evidence that indicates an actual decline in visitation over the years since the 2007 MMP.

### ***Future Anticipated Trends***

With expected slow growth in regional visitation, combined with potential increases in Monument visitations described in the 2007 MMP, there could be a gradual increase in recreation within the Monument. Increased demand for various OHV opportunities in the Monument may occur as well.

### **Cumulative Effects**

***Recreation and Visitor Experience: All Alternatives***

Under Alternatives A-E, the cumulative effects of proposed actions would range from negligible to minor long-term impacts depending on the recreation experience desired. These impacts would range from use-conflicts to recreation opportunity improvements such as enhanced hunting, studying, and scenic driving and exploring opportunities. These cumulative effects are projected to last the duration of this MMP Amendment.

**4.3.1.13. Socioeconomic Values*****Region of Influence***

When an industry within a given economic region sells its products, there are direct economic impacts in terms of the revenues that flow either within or into the region. In the case of the present analysis, revenues will flow to ranches with headquarters located within the region, resulting in economic impacts due to ranch spending. In addition to those direct impacts, there are secondary economic impacts due to “re-spending” of that money by ranches, their employees, and their suppliers, both inside and outside of the region. Conversely, reductions in revenue in-flows, such as reduced economic activity within the cattle and sheep industries, due to decreased grazing AUMs within the region, will reduce economic activity within the region in similar proportions.

***Past and Current Trends***

In recent years, total revenue from sales of agricultural output in the five-county study area has increased. Livestock sales as a percentage of overall agricultural sales has not fluctuated a great deal, but the total dollar amount represented by livestock-related output has increased quite a bit during the time period since 2010. At 12.5%, agriculture is larger as a percentage of overall income in the study area than it is within the U.S. as a whole, for which agriculture makes up 1% of total income.

***Future Anticipated Trends***

Based on recent increases in demand for locally-, naturally-, and sustainably grown food products, it is possible that there will be an increase in regional demand for the output of livestock operations in Idaho. While it is impossible to know how markets will respond and adapt to new situations, it is likely that these changes will result in more favorable market conditions for ranchers within the study area.

**Cumulative Effects*****Socioeconomic Values: All Alternatives***

To the degree that agricultural operations do or don't hire employees and obtain supplies within the region, this secondary spending will have a greater or lesser positive impact on the regional economy. The table below displays estimated initial and secondary impacts from the economic activities of grazing-related cattle and sheep ranching within the five-county region of analysis.

**Table 4.8. Estimated Cumulative Socioeconomic Impacts by Alternative**

	Employment Effects (Jobs)				Labor Income Effects (\$1,000)				Output Effects (\$1,000)			
	Direct	Indi- rect	Total	Multi- pliers	Direct	Indi- rect	Total	Multi- pliers	Direct	Indi- rect	Total	Multi- pliers
<b>Cattle</b>	2.7	1.2	4.4	1.63	135	49	203	1.50	570	171	807	1.42
<b>Sheep</b>	3.3	0.2	4.6	1.39	335	12	381	1.14	650	31	805	1.24
<b>Cattle</b>	Each job in this region in the cattle industry is estimated to generate additional labor demand equating to an additional 0.6 “jobs” within the region				Each dollar spent in this region on labor in the cattle industry is estimated to generate an additional \$0.50 of labor spending within the region				Each dollar spent on this region’s output in the cattle industry is estimated to generate an additional \$0.42 in economic activity within the region			
<b>Sheep</b>	Each job in this region in the sheep industry is estimated to generate additional labor demand equating to an additional 0.4 “jobs” within the region				Each dollar spent in this region on labor in the cattle industry is estimated to generate an additional \$0.14 of labor spending within the region				Each dollar spent on this region’s output in the cattle industry is estimated to generate an additional \$0.24 in economic activity within the region			

Based on results from additional IMPLAN regional economic analysis, the cattle and sheep industries in Blaine and Minidoka counties have higher economic multipliers than does either the study area as a whole or the three other counties within the region. This is due to the existence of supply sources within Blaine and Minidoka counties. Based on existing industry data, ranching activity based in Butte, Lincoln, and Power depends on supply sources outside of those individual counties. The most likely sources of input goods and labor for those counties include cities outside of the five-county region, such as Pocatello or Idaho Falls, or even outside of Idaho. Due to those likely sources being located outside of the region of analysis, the influence of the relatively higher multiplier effects in Blaine and Minidoka counties is somewhat tempered, and the overall multipliers shown in the tables above are lower than they would be were more supply sources located either within the counties without larger communities, or were they located adjacent to them, but within the five-county region. Some of the impacts of reduced grazing within the study area will be felt by counties outside of the five-county region.

Because it is not possible to accurately predict what will occur in the livestock markets of the future, it is important to refrain from assuming that the conditions that exist today will continue to exist in the future. All outcomes are prospective, uncertain outcomes. What this means for livestock producers is that retaining the right to specific numbers of AUMs is a desirable means of maintaining the ability to respond in the most advantageous way to future adjustments in markets. Should agency managers determine that AUM use must be permanently reduced in order to adequately protect sensitive natural resources, then ranchers will need to make adjustments in their long-term contingency plans. How ranchers’ plans will change is also uncertain, and there are many possible configurations of local, regional, and national beef and sheep production systems.

#### 4.3.1.14. Climate Change

##### *Region of Influence*

The area of analysis for cumulative effects on climate change is defined as the grazing allotments wholly or partially within the Monument. Any methane emissions resulting from livestock grazing administration within the Monument would disperse into the atmosphere.

##### *Past and Current Trends*

Past events that may have contributed to climate change include wildfires and possibly historic grazing in the early 1900's when livestock numbers were at an all-time high. In 2011, the principle sources of Idaho's GHG emissions were energy and agriculture, accounting for 57% and 36% of Idaho's gross GHG emissions, respectively. Within the energy sector, transportation accounted for the majority of emissions [World Resources Institute, 2014].

### ***Future Anticipated Trends***

While long-range regional changes might include the Monument, it is impossible to predict precisely when they could occur. Measurable change may occur beyond the life of the Plan. Indicators of climate change include temperature, precipitation, snowpack, stream flow, stream temperature, plant phenology, wildfire, and vegetation dynamics [Gillis et al., 2010], all of which continue to change throughout Idaho. A recent study of Idaho meteorological data collected from 1968 to 2008 shows a decrease in precipitation and an increase in temperature across the state [Sohrabi, Ryu, Abatzoglou, & Tracy, 2012]. Within the Monument area, trends in temperature and precipitation generally appear to fall within the historical range of variability (1901–2012), although temperature extremes (extreme warm) have occurred [USDI NPS, 2014]; [Monahan & Fisichelli, 2014].

### **Cumulative Effects**

#### ***Climate Change: Alternatives A-E***

Because there are negligible impacts to climate change under all alternatives, there would be no cumulative impacts to climate change.

## **4.3.2. Irreversible and Irretrievable Commitment of Resources**

NEPA requires a discussion of any irreversible or irretrievable commitments of resources, which would result from an implemented proposal. An irreversible resource commitment refers to nonrenewable resources, is final, and cannot be changed. For example, destruction of cultural resource values. An irretrievable resource commitment refers to decisions resulting in the loss of production or use of a resource. For example, a decision not to treat woodlands encroaching into adjacent grassland habitat results in the irretrievable loss of forage production from the grassland community. This action is not irreversible, because once a treatment is applied, the forage production of the grassland is restored.

The decision to select one of the alternatives described does not constitute an irreversible or irretrievable commitment of resources because the decision does not authorize on-the-ground activities. Instead, decisions made in the selected plan serve to guide future actions and subsequent site-specific decisions. Following the signing of the Record of Decision for the MMP, subsequent implementation plans (e.g., activity- or project-specific plans) would be developed and implemented by the BLM. Implementation requires appropriate project-specific planning, NEPA analysis, and final BLM approval authorizing on-the-ground activities to proceed.

## **4.3.3. Unavoidable Adverse Impacts**

Section 102 (C) of NEPA requires disclosure of any adverse environmental effects that cannot be avoided following implementation of a proposal. Unavoidable adverse impacts are those that remain following the implementation of mitigation measures or impacts for which no mitigation

measures exist. Unavoidable adverse impacts for all activities were disclosed in the 2007 MMP. Some unavoidable adverse impacts would occur as a result of MMP Amendment implementation. Others are a result of public use of lands within the planning area. Surface-disturbing activities would cause localized unavoidable impacts. Although these impacts would be mitigated to the extent possible, unavoidable damage is inevitable. The greatest unavoidable adverse impact would result from habitat fragmentation due to the inability to restore non-shrub areas.

In some circumstances, the loss of sagebrush steppe habitat either by direct disruption or by the spread of noxious weeds and invasive plants would be irreversible. In other instances, reversing the loss of habitat would take many years to complete, thus irreversibly affecting wildlife that depend on these habitats.

Inadvertent damage to or loss of cultural resources from livestock grazing, intentional vandalism, and other surface-disturbing activities is unavoidable. Although mitigation measures could be implemented, the impacts on the area during rehabilitation, restoration, and facility development could not be mitigated. The number of sites that could be inadvertently damaged by wildfire is unknown, but the likelihood of damage or disturbance is directly proportional to the acreage affected. Numerous land use restrictions imposed throughout the planning area to protect sensitive resources and other important values, by their nature, would impact the ability of permittees, individuals, and groups who use the public lands to do so freely without limitations. Although attempts are made to minimize these impacts by limiting the protection level necessary to accomplish objectives, unavoidable adverse impacts would occur.

#### **4.3.4. Relationship Between Local Short-Term Uses and Long-Term Productivity**

Section 102(C) of NEPA requires discussion of the relationship between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity of resources. As discussed in the introduction to this chapter (4.1) short-term impacts are those changes that are caused by ground-disturbing activities that generally revert to pre-disturbed conditions within a few years. Long-term impacts persist beyond a few years. Under all alternatives, short-term disturbances of soils, vegetation, and wildlife habitat from vegetation treatments would be more than offset by the long-term productivity of the restored sagebrush steppe habitat. This would be particularly true for Alternatives B, C, and E with the greater emphasis on long-term restoration of habitat. Management actions to improve soil, water, riparian, vegetation, and habitat resources would improve the productivity of wildlife and special status species habitats throughout the Planning Area. These activities are directed toward achieving long-term improvement in ecosystem productivity. Long-term impacts on soil structure and vegetation would occur in specific areas where concentrated livestock grazing occurs. However, concentrating livestock use to certain areas would limit the adverse impacts from extending to other areas of the Planning Area.



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## **Chapter 5. Consultation and Coordination**

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## 5.1. Introduction

The BLM conducted this planning process in accordance with requirements of NEPA, CEQ regulations, and the Department of the Interior and BLM regulations and policies. NEPA and associated regulatory/policy framework require federal agencies to involve interested publics in their decision-making, consider a range of reasonable alternatives to proposed actions, and prepare environmental documents that disclose the potential impacts of proposed actions and alternatives.

Title II, Section 202 of FLPMA directs BLM to coordinate planning efforts with American Indian Tribes, other federal agencies, and State and local governments as part of its land use planning.

This chapter documents BLM's collaborative approach throughout the development and release of the draft MMP Amendment/EIS for the Craters of the Moon National Monument and Preserve. In developing these documents, BLM enabled stakeholders to participate at the level and to the degree that best met their needs and interests. Those ways included obtaining updates via newsletters and open houses, developing products, and engaging in discussions and issue resolution. The distinction between public involvement (i.e., information sharing and feedback) and collaboration (i.e., product development interaction) is instrumental in understanding and appreciating BLM's approach.

## 5.2. Key Planning Checkpoints

The collaborative process used “key checkpoints” so stakeholders knew who would have input into product development and at what stage. Using this iterative approach, draft products were developed and then circulated through the structured checkpoints. These provided for consistency with other planning efforts, met public expectations, and provided a two-way understanding of actions and their impacts.

Checkpoints included:

- Product development by the Craters of the Moon National Monument and Preserve ID Team
- Review by the affected Native American Tribes
- Review of products by the Twin Falls District RAC and Cooperating Agencies
- Public input
- ID Team refinement through assimilation of new information into the affected documents

### 5.2.1. Interdisciplinary Team

Products circulated through each checkpoint were resubmitted to the ID Team, a group of resource specialists responsible for developing the plan's components within their respective fields. Typically, it accepted all input and suggestions generated through the various checkpoints and considered, addressed, and refined the product(s), as appropriate.

## 5.2.2. Tribal Consultation

In keeping with Tribal preferences, applicable laws, regulations, and policies, regular consultations were held with Tribal officials. From a regulatory standpoint, BLM must use the consultation process to “identify the cultural values, religious beliefs, traditional practices, and legal rights of Native American People which could be affected by BLM actions on Federal lands.” From the beginning, meetings were held with the Shoshone-Paiute and Shoshone-Bannock Tribes to determine consultation procedures, format, and key junctures.

Consultation with the Shoshone-Paiute Tribes of the Duck Valley Indian Reservation occurs through the Wings and Roots Native American Campfire process initiated by them and Twin Falls District several years ago to facilitate their government-to-government relationship.

The Shoshone-Bannock Tribes chose to be involved on both a government-to-government and staff-to-staff basis. They provided information about their Tribal perspective and, together with BLM, identified appropriate methods for addressing issues through face-to-face meetings and document reviews. The Shoshone-Bannock Tribe and BLM work to maintain the coordination at both levels.

All Tribal consultation and input occurred through direct interaction between BLM staff and Tribal representatives. The ID Team incorporated Tribal perspectives into products under development.

## 5.2.3. Other Formal Consultation

### *U.S. Fish and Wildlife Service*

The Endangered Species Act of 1973 (ESA), as amended, directs federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the existence of any listed species or destroy or adversely modify critical habitat (50 CFR 400). The ESA authorizes federal agencies to enter into early consultation with the USFWS to make those determinations. The USFWS has provided a list of endangered, threatened, proposed, and/or candidate species that may be present in the five-county area surrounding the Monument. According to this list, threatened and endangered animal species that could potentially occur in counties that span the Monument are Canada lynx (*Lynx canadensis*), yellow-billed cuckoo (*Coccyzus americanus*), bull trout (*Salvelinus confluentus*), and Snake River Physa snail (*Physa natricina*). BLM expects that there will be "No Effect" to Canada lynx, yellow-billed cuckoo, bull trout, or Snake River Physa snail as a result of this MMP Amendment.

### *State Historic Preservation Office*

The SHPO must be consulted concerning any resource management proposals that might affect a cultural property listed on or eligible for the National Register of Historic Places (NRHP). Consultation with SHPO is a normal part of the planning process. No NRHP listed or eligible properties would be affected.

## 5.2.4. Coordination with Other Organized Entities

### *Resource Advisory Council*

The Twin Falls District RAC is a fifteen-member, Federal Advisory Committee Act-chartered group responsible for providing consensus-based advice to BLM. The RAC received briefings and was afforded opportunities to comment on product and processes at their regularly scheduled meetings. The RAC has been actively involved with product development, public meetings, developing alternatives, and providing a unique perspective relative to other collaborative processes.

### ***Cooperating Agencies***

Cooperator status was offered to and accepted by the Idaho Department of Agriculture, Blaine County, Power County, and the City of American Falls. To be a cooperating agency, there must be jurisdictional overlap with BLM, the agency must be able to offer special expertise, and their involvement should enhance coordination and consistency. Each cooperator signed a formal, cooperating agency memorandum of agreement and their representatives participated in the planning process.

## **5.2.5. General Public and Other Collaborative Activities**

Since different people and stakeholders prefer different levels of involvement, multiple opportunities were provided so that everyone could participate at the level that best suited them. Therefore, activities were designed to range from simple information sharing and feedback to involvement in product development to meet specific stakeholder needs and their desired level of involvement.

The participation and engagement of special interests groups, landowners, and general public/stakeholders was solicited throughout the process. Participation included open houses and community meetings.

Personal contacts, news releases, newsletters, e-mail notices, a BLM planning website, and Federal Register notices were the primary tools used to communicate with stakeholders and collaborators. Upon request, BLM provided presentations and had informal discussions relative to specific concerns.

Through collaboration, processes and products were revised, as necessary. As a result, plan amendment alternatives were designed, to the extent possible, to achieve the DFCs developed in the original 2007 MMP.

## **5.3. Future Collaboration**

The collaborative process will continue through the MMP's completion, and during development of implementation plans after the Record of Decision (ROD) is signed. Future public involvement will be based on existing understandings, processes, and structured checkpoints.

- Public notifications will occur through newsletters, media releases, web postings, and key contacts with stakeholders. Such communications will continue through the release of the ROD.
- Community meetings will be held to clarify information and help the public understand the proposed action. Such communications will continue through the release of the ROD.
- Formal consultation with the Tribes and SHPO will occur throughout the MMP Amendment process and, as appropriate, during plan implementation.

- Ongoing coordination with local governments and special interest groups will occur through the comment period and subsequent analysis as appropriate.
- Comment response will occur at the conclusion of the formal comment period when the ID Team completes a detailed comment analysis. The BLM will forward the comment analysis results to the RAC and cooperating agencies to determine appropriate responses to the comments, including any alternatives' additions or modifications.
- Any substantive changes between the Draft and Proposed MMP Amendment will be reviewed by the Tribes, SHPO, the RAC, and cooperating agencies. Public meetings will be held to solicit feedback on the proposed changes.
- The EIS will respond, where appropriate, to all substantive, written comments received during the comment period, and will incorporate changes resulting from the collaborative revision process. The ROD will be issued by BLM after the release of the Final EIS, Governor's Consistency Review, and resolution of any protests.

## **5.4. List of Interested Parties and Stakeholders**

The following is a list of the agencies, organizations, and individuals who expressed interest in the MMP Amendment/EIS during the preparation of this document.

### ***Native American Tribes***

Shoshone-Bannock Tribes

Shoshone-Paiute Tribes

### ***Government Agencies and Representatives***

Blaine County

City of Arco

City of Carey

City of Rupert

Congressman Mike Simpson

Butte County

Environmental Protection Agency

Governor C. L. "Butch" Otter

Idaho State Department of Agriculture

Idaho Department of Environmental Quality

Idaho Department of Fish and Game

Idaho Department of Lands

Idaho Office of Species Conservation

Minidoka County

Senator Mike Crapo

State of Idaho

***Business Organizations and Other Groups***

Idaho Farm Bureau Federation

Permittees

Prairie Falcon Audubon Inc.

National Parks Conservation Association

The Pioneers Alliance

Western Watersheds Project

WildLands Defense

## **5.5. List of Preparers**

**Table 5.1. List of Preparers**

Name	Responsibility	Qualifications
Tara Anderson	Wildlife Biologist	MSc Natural Resources and Environmental Studies - Biology  BAc Ecology (minor in Chemistry); 7 Years Experience
David Freiberg	Recreation Planner	BA Natural History, MA Environmental Studies; 20 Years Experience
Lisa Cresswell	Project Manager/Team Lead, Archaeologist	MA Anthropology; 25 Years Experience
Nathan Jayo	Recreation Planner	BS Resource Recreation and Tourism w/ Minor in Parks, Protected Areas, and Wilderness Conservation; 12 Years Experience
Cassondra Mavencamp	GIS, Writer/Editor	BS Biology (concentration in Organismal Ecology); 10 Years Experience
Danelle Nance	Natural Resource Specialist	BS Agricultural Science & Technology; 14 Years Experience
Dan Patten	Rangeland Management Specialist	BS Range Resources  BS Wildlife Management  MS Rangeland Ecology; 14 Years Experience



Jesse Rawson	Wildlife Biologist	B.S. Wildlife Resources; 9 Years Experience
Julie Suhr-Pierce	Socioeconomist	PhD Economics; 30 Years Experience

# Appendix A. Bibliography

## Bibliography

- Aldridge, C. L., S. E. Nielsen, H. L. Beyer, M. S. Boyce, J. W. Connelly, S. T. Knick, & M. A. Schroeder. (2008). Range-wide patterns of greater sage-grouse persistence. *Diversity and Distributions* 17, 983-994.
- Alexander, J.A., Liston, A., & Popovich, S.J. (2004). Genetic Diversity of the Narrow Endemic *Astragalus oniciformis* (Fabaceae). *American Journal of Botany*, 91(12), doi: 10.3732/ajb.91.12.2004 .
- Alpe, M. J., Kingery, J. L., & Mosley, J. C. (1999). Effects of Summer Sheep Grazing on Browse Nutritive Quality in Autumn and Winter. *Journal of Wildlife Management*, 63(1), 346-354.
- Anderson, J.E., & K.E. Holte. (1981). Vegetation development over 25 years without grazing on sagebrush-dominated rangeland in southeastern Idaho. *Journal of Range Management* 34, 25-29.
- Anderson, J. E., & Inouye, R. S. (2001). Landscape-Scale Changes in Plant Species Abundance and Biodiversity of a Sagebrush Steppe over 45 Years. *Ecological Monographs*, 71(4), 531-556. Retrieved April 9, 2014, from <http://www.jstor.org/stable/3100035>.
- Armour, C. L., Duff, D. A., & Elmore, W. (1991). Position statement on the effects of livestock grazing on riparian and stream ecosystems. *Fisheries*. 16(1), 7-11.
- Austin, D. (2000). Managing Livestock Grazing for Mule Deer (*Odocoileus hemionus*) on Winter Range in the Great Basin. *Western North American Naturalist*, 60(2), 198-203.
- Baker T., Boren J., Allison C.D. (2001). Strategies for livestock management in riparian areas in New Mexico. College of Agriculture and Home Economics Guide B-119. New Mexico State University, Las Cruces, New Mexico. Available: [http://aces.nmsu.edu/pubs/\\_b/B-119.pdf](http://aces.nmsu.edu/pubs/_b/B-119.pdf).
- Barnett, J.K., & J.A. Crawford. (1994). Pre-laying nutrition of sage grouse hens in Oregon. *Journal of Range Management*, 47(2), 114–118.
- Bauer, K. L. 1991. Observations on the developmental biology of *Cicindela Arenicola* Rumpff (Coleoptera: Cicindelidae). *Great Basin Naturalist*, 51(3), 226–235.
- Beck, J. L., & Mitchell, D. L. (2000). Influences of Livestock Grazing on Sage Grouse Habitat. *Wildlife Society Bulletin*, 28(4), 993-1002. Retrieved from <http://www.jstor.org/stable/3783858>.
- Beever, E. A. (2002). Persistence of pikas in two low-elevation national monuments in the western United States. *Park Science*, 21, 23-29.
- Belnap, J. (2003). The World at Your Feet: Desert Biological Soil Crusts. *Frontiers in Ecology and the Environment*. 1(4), 181-189. Retrieved March 14, 2014, from <http://www.jstor.org/stable/3868062>.

- Beneficial Use Reconnaissance Program (BURP). (2007). Idaho Department of Environmental Quality, Twin Falls, Idaho.
- Berry, J.D., & Eng, R.L. (1985). Interseasonal movements and fidelity to seasonal use areas by female sage grouse. *Journal of Wildlife Management* 49, 237–240.
- Blaisdell, J. P., Murray, R. B., & McArthur, E. D. (1982). Managing Intermountain Rangelands — Sagebrush-Grass Ranges. General Technical Report INT-134. USDA Forest Service (USDA FS).
- Bratton, J. H. (1990). Seasonal pools - an overlooked invertebrate habitat. *British Wildlife*, 22-29.
- Braun, C.E. (2006). A blueprint for sage-grouse conservation and recovery. Grouse Inc., Tucson, Arizona.
- Braun, C. E., Baker, M. F., Eng, R. L., Gashwiler, J. S., & Schroeder, M. H. (1976). Conservation committee report on effects of alteration of sagebrush communities on the associated avifauna. *Wilson Bulletin* 88, 165-171.
- Brewer, T. K., Mosley, J. C., Lucas, D. E., & Schmidt, L. R. (2007, September). Bluebunch Wheatgrass Response to Spring Defoliation on Foothill Rangeland. *Rangeland Ecology & Management*, 60(5), 498-507. Retrieved from <http://www.jstor.org/stable/4540849>.
- Briske, D. D., Fuhlendorf, S. D., & Smeins, F. E. (2005). State-and-Transition Models, Thresholds, and Rangeland Health: A Synthesis of Ecological Concepts and Perspectives. *Rangeland Ecology & Management*, 58(1), 1–10. Retrieved August 9, 2010, from <http://jstor.org/stable/3899791>.
- Bunting, S. C., Kingery, J. L., Hemstrom, M. A., Schroeder, M. A., Gravenmier, R. A., & Hann, W. J. (2002, September). Altered Rangeland Ecosystems in the Interior Columbia Basin. General Technical Report PNS-GTR-553. USDI BLM.
- Caicco, S. L., & Wellner, C.A. (1983a). Research Natural Area Recommendation for Big Juniper Kipuka. BLM.
- Caicco, S. L., & Wellner, C.A. (1983b). Research Natural Area Recommendation for Brass Cap Kipuka. BLM.
- Caicco, S. L., & Wellner, C.A. (1983c). Research Natural Area Recommendation for Sand Kipuka. BLM.
- Cassirer, F. E., & Sinclair, A.R.E (2007). Dynamics of Pneumonia in a Bighorn Sheep Metapopulation. *Journal of Wildlife Management*, 71:1080–1088..
- Chambers, J.C. & M. Pellant. 2008.Climate change impacts on northwestern and intermountain United States rangelands. *Rangelands*, 30(3):29–33, from [http://dx.doi.org/10.2111/1551-501X\(2008\)30\[29:CCIONA\]2.0.CO;2](http://dx.doi.org/10.2111/1551-501X(2008)30[29:CCIONA]2.0.CO;2).
- Christiansen, T. (2009). Fence marking to reduce greater sage-grouse collisions and mortality near Farson, Wyoming – summary of interim results. Wyoming Game and Fish Department unpublished interim report.

- Clark, L., J. Hall, R. McLean, M. Dunbar, K. Klenk, R. Bowen, & C. A. Smeraski. (2006). Susceptibility of greater sage-grouse to experimental infection with West Nile virus. *Journal of Wildlife Diseases*, 42:14-42.
- Climate Change Supplementary Information Report (SIR). (2010). Climate change supplementary information report for Montana, North Dakota, and South Dakota, Bureau of Land Management. Report on greenhouse gas emissions and climate change for Montana, North Dakota, and South Dakota. Technical report prepared for the Montana/Dakotas Bureau of Land Management by URS Corporation. URS Project 22241790.
- Clinton, W.J. (2000). Proclamation 7373 - Boundary Enlargement of the Craters of the Moon National Monument, November 9, 2000. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=62283>.
- Coates, P. S. (2007). Greater Sage-Grouse (*Centrocercus urophasianus*) nest predation and incubation behavior. Idaho State University, Boise.
- Connelly, J.W., & Braun, C.E. (1997). Long-term changes in Sage Grouse *Centrocercus urophasianus* populations in western North America. *Wildlife Biology* 3, 229-234.
- Connelly, J.W., Browsers, H.W., & Gates, J. (1988). Seasonal movements of sage grouse in southeastern Idaho. *Journal of Wildlife Management* 52, 116–122.
- Connelly, J.W., Knick, S.T., Schroeder, M.A., & Stiver, S.J. (2004). Conservation assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies. Cheyenne, Wyoming.
- Connelly, J.W., Schroeder, M.A., Sands, A.R., & Braun, C.E. (2000). Guidelines to manage sage grouse populations and their habitats. *Wildlife Society Bulletin* 28(4), 967-985.
- Connelly, J.W., Wakkinen, W.L., Apa, A.P., & Reese, K.P. (1991). Sage-grouse use of nest sites in southeastern Idaho. *Journal of Wildlife Management* 55, 521-524.
- Cooperrider, A.Y., Boyd, R.J., & Stuart, H.R., Editors. (1986). Inventory and monitoring of wildlife habitat. United States Department of the Interior, Bureau of Land Management, Denver, Colorado.
- Courtois, D. R., Perryman, B. L., & Hussein, H. S. (2004, November). Vegetation Change after 65 Years of Grazing and Grazing Exclusion. *Journal of Range Management*, 57(6), 574-582. Retrieved April 18, 2014, from <http://www.jstor.org/stable/4004011>.
- Cox, R. D., & Anderson, V. (2004, March). Increasing Native Diversity of Cheatgrass-Dominated Rangeland through Assisted Succession. *Journal of Range Management*, 57(2), 203-210. Retrieved from <http://www.jstor.org/stable/4003920>.
- Crawford, J.A., Olson, R.A., West, N.E., Mosley, J.C., Schroeder, M.A., Whitson, T.D., Miller, R.F., Gregg, M.A., & Boyd, C.S. (2004). Ecology and management of sage-grouse and sage-grouse habitat. *Journal of Range Management*, 57(2), 2–19.
- Curtin, C. G. (2002). Livestock Grazing, Rest and Restoration in Arid Landscapes. *Conservation Biology*, 16(3), 840–842.

- Davies, K. W., Bates, J. D., Svejcar, T. J., & Boyd, C. S. (2010). Effects of long-term livestock grazing on fuel characteristics in rangelands: An example from the sagebrush steppe. *Rangeland Ecological Management* 63, 662-669. November 2010.
- Davies, K. W., Svejcar, T. J., & Bates, J. D. (2009). Interaction of historical and nonhistorical disturbances maintains native plant communities. *Ecological Applications*, 19(6), 1536-1545.
- Davies, K. W., Vavra, M., Schultz, B. W., & Rimbey, N. R. (2014). Implications of Longer Term Rest from Grazing in the Sagebrush Steppe. *Journal of Rangeland Applications*. 1, 14–34.
- Day, T. A., & Wright, R. G. (1985, January). The Vegetation Types of Craters of the Moon National Monument. Forest, Wildlife, and Range Experiment Station. University of Idaho, Moscow, Idaho.
- Dealy, J. E., Leckenby, D. A., & Concannon, D. M. (1981). Wildlife habitats in managed rangelands - the Great Basin of southeastern Oregon: plant communities and their importance to wildlife. USDA Forest Service general technical report PNW-120.
- DeLong, A. K., Crawford, J. A., & DeLong, D. C., Jr. (1995). Relationships between vegetational structure and predation of artificial sage-grouse nests. *Journal of Wildlife Management* 59, 88-92.
- DeRamus, H. A., Clement, T. C., Giampola, D. D., & Dickison, P. C. (2003). Methane emissions of beef cattle of forages: efficiency of grazing management systems. *Journal of Environmental Quality* 32:269-277.
- Derner, J. D., & Schuman, G. E. (2007). Carbon sequestration and rangelands: A synthesis of land management and precipitation effects. *Journal of Soil and Water Conservation*, 62(2), 77–85. Retrieved from: [https://afrsweb.usda.gov/SP2UserFiles/Place/30180000/DernerPDF/32.JSWC62\(2\)Derner.pdf](https://afrsweb.usda.gov/SP2UserFiles/Place/30180000/DernerPDF/32.JSWC62(2)Derner.pdf).
- Diamond, J.M., Call, C.A., & Devoe, N. (2009). Effects of targeted cattle grazing on fire behavior of cheatgrass-dominated rangeland in the northern Great Basin, USA. *International Journal of Wildland Fire*, 18, 944–950. doi:10.1071/WF08075.
- Dobkin, D. S. (1995). Management and conservation of sage-grouse, denominative species for the ecological health of shrubsteppe ecosystems. United States Department of Interior, Bureau of Land Management, Portland, Oregon.
- Doherty, M. K. (2007). Mosquito populations in the Powder River Basin, Wyoming: A comparison of natural, agricultural, and effluent coal-bed natural gas aquatic habitats. Thesis. Montana State University, Bozeman, Montana.
- Environmental Protection Agency (EPA). (2009). Inventory of U.S. greenhouse gas emissions and sinks: 1990 – 2007. <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.
- Environmental Protection Agency (EPA). (2013). Revisions to the greenhouse gas reporting rule and proposed confidentiality determinations for new or substantially revised data elements; proposed rule. 40 CFR Part 98, Federal Register Vol. 78, No. 63.
- Environmental Protection Agency (EPA). (2014a). Greenhouse gas inventory data explorer. <http://www.epa.gov/climatechange/ghgemissions/inventoryexplorer>.

- Environmental Protection Agency (EPA). (2014b). Inventory of U.S. greenhouse gas emissions and sinks: 1990-2012. EPA 430-R-14-003. Washington, D.C.
- Falter, M. C., & Freitag, R. J. (1996). Baseline study of water resources on Craters of the Moon National Monument, Idaho. Technical report NPS/CCSOUI/NRTR-96/06.
- Follett, R. F., Kimble, J. M., & Lal, R. (2001). The potential of U.S. grazing lands to sequester carbon and mitigate the greenhouse effect. CRC Press LLC. Boca Raton, Florida.
- Foster, M., & Foster, L. (2015). Idaho; Bighorn Sheep Core Herd Home Range Delineations. U.S. Forest Service. Unpublished Report.
- Gabler, K. L., Heady, L. T., & Laundre, J. W. (2001). A habitat suitability model for pygmy rabbits (*Brachylagus idahoensis*) in southeastern Idaho. *Western North American Naturalist* 61, 480-489.
- Ganskopp, D. (1988, November). Defoliation of Thurber Needlegrass: Herbage and Root Responses. *Journal of Range Management*, 41(6), 472-476. Retrieved March 15, 2014, from <https://journals.uair.arizona.edu/index.php/jrm/article/viewFile/12852/12129#page=27>.
- Ganskopp, D. (1998, May). Thurber Needlegrass: Seasonal Defoliation Effects on Forage Quantity and Quality. *Journal of Range Management*, 51(3), 276-281. Retrieved March 15, 2014, from <http://oregonstate.edu/dept/EOARC/sites/default/files/publication/419.pdf>.
- Ganskopp, D. C., & Bedell, T. E. (1981, March). An Assessment of Vigor and Production of Range Grasses following Drought. *Journal of Range Management*, 34(2), 137-141. Retrieved April 16, 2014, from <http://www.jstor.org/stable/3898130>.
- Ganskopp, D., Svejcar, T., Taylor, F., Farstvedt, J., & Paintner, K. (1999). Seasonal Cattle Management in 3 to 5 Year Old Bitterbrush Stands. *Journal of Range Management*, 52, 166-173.
- Gardner, P.A., Stevens, R., & Howe, F.P. (1999). A handbook of riparian restoration and revegetation for the conservation of land birds in Utah with emphasis on habitat types in middle and lower elevations. U.S. Fish and Wildlife Service Partnership for Wildlife ACT Program - Grant PW-5, Utah Division of Wildlife Resources, publication number 99-38.
- Garton, E. O., Connelly, J. W., Horne, J. S., Hagen, C. A., Moser, A., & Schroeder, M. (2011). Greater sage-grouse population dynamics and probability of persistence. S.T. Knick and J.W. Connelly (editors). *Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and its Habitats*. Studies in Avian Biology 38, 239–382. University of California Press, Berkeley, California.
- Gerber, P. J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. & Tempio, G. (2013). Tackling climate change through livestock – a global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome. <http://www.fao.org/docrep/018/i3437e/i3437e.pdf>.
- Gillis, S., Knapp, B., Wolf, J., Izo, J., McElliot, K., Reader, J., Peterson, A., VanSant, D., & Weller, N. (2011). Indicators of climate change in Idaho report summary: understanding

- climate change and its impacts through indicators. University of Idaho. Retrieved from <http://webpages.uidaho.edu/jabatzoglou/PDF/IndicatorsofClimateChangeIdaho.pdf>.
- Gregg, M. A. (1991). Use and selection of nesting habitat by sage-grouse in Oregon. Thesis, Oregon State University, Corvallis.
- Gregg, M.A., Crawford, J.A., Drut, M.S., & DeLong, A.K. (1994). Vegetational cover and predation of sage grouse nests in Oregon. *Journal of Wildlife Management*, 58, 162-166.
- Griffith, B. (1983). Ecological characteristics of mule deer: Craters of the Moon National Monument, Idaho. Thesis. University of Idaho College of Forestry, Moscow, Idaho.
- Hagen, C. A., Connelly, J. W., & Schroeder, M. A. (2007). A meta-analysis of greater sage-grouse *Centrocercus urophasianus* nesting and brood-rearing habitats. *Wildlife Biology*. 13, Suppl. 1, 42-50.
- Hanser, S. E., & Knick, S. T. (2011). Greater sage-grouse as an umbrella species for shrubland passerine birds: a multi-scale assessment. *Studies in Avian Biology*, 475–488.
- Headwaters Economics. Economic Profile System-Human Dimensions Toolkit. (2014).
- Hempy-Mayer, K., & Pyke, D. A. (2008, January). Defoliation Effects on *Bromus tectorum* Seed Production: Implications for Grazing. *Rangeland Ecology & Management*, 61(1), 116-123. Retrieved from <http://www.jstor.org/stable/25146757>.
- Henderson, F., & Murie, A. (1958, October 20). Proposed Addition to Craters of the Moon National Monument. USDI NPS.
- Henrikson, L. S. (2005). "Using Geospatial Data to Interpret the Holocene Archaeological Record on the Craters of the Moon National Monument and Preserve." Craters of the Moon Science Symposium, Pocatello, Idaho. Paper presentation.
- Henrikson, L. S., Guenther, M., & Cravins, C. (2009). "Shoshone Field Office BLM Archaeological Overview." Report of research compiled for the Bureau of Land Management by the Center for Archaeological Research, California State University, Bakersfield. Copy on file at the Shoshone Field Office BLM, Idaho.
- Henrikson, L. S., McAlister, K. W., & Long, M. M. (2006). "Craters of the Moon National Monument and Preserve Archaeological Overview." Report of research compiled for the Bureau of Land Management and the National Park Service by the Museum of Natural and Cultural History, University of Oregon, Eugene Report 2006-022. Copy on file at the Shoshone Field Office BLM, Idaho.
- Herrick, J. E., Van Zee, J. W., Havstad, K. M., Burkett, L. M., & Whitford, W. G. (2005). Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems, Volume II: Design, supplementary methods and interpretation. USDA-ARS Jornada Experimental Range. ISBN 0-97755552-0-0. The University of Arizona Press, Tucson, Arizona.
- Hironaka, M., Fosberg, M. A., & Winward, A. H. (1983, May). Sagebrush-Grass Habitat Types of Southern Idaho. Forest, Wildlife, and Range Experiment Station. Bulletin No. 35. University of Idaho. Moscow, Idaho.

- Hoffman, R. A. (1988). Craters of the Moon National Monument base-line inventory and monitoring (wildlife) final report, Report B-88. University of Idaho, Cooperative Park Studies Unit, Moscow, Idaho.
- Holmes, A. L., Green, G. A., Morgan, R. J., & Livezey, K. B. (2003). Burrowing Owl Nest Success and Burrow Longevity in North Central Oregon. *Western North American Naturalist*, 63 (2), 244-250.
- Horning, D. S., Jr., & Barr, W. F. (1970). Insects of Craters of the Moon National Monument, Idaho. University of Idaho College of Agriculture, Miscellaneous series no. 8.
- Hosten, P.E. Whitridge, H., & Broyles, M. (2007). Diet overlap and social interactions among cattle, horses, deer and elk in the Cascade-Siskiyou National Monument, southwest Oregon. U.S. Department of the Interior, Bureau of Land Management, Medford District. Available at: <http://soda.sou.edu/bioregion.html>.
- Hurlbutt, D.C. (1998). Order of partial decree, water right nos. 34-13586, 34-13587, 34-12383/36-15342, 34-12384/36-15343, 34-12385/36-15344, 34-12386, 34-12387, 34-12388, 34-12389, 36-15345, and 36-15346, Presiding Judge, Snake River Basin Adjudication, Fifth Judicial District for the State of Idaho.
- Hutten, Martin (2008). Lichens & Mosses of Craters of the Moon National Monument. Unpublished inventory obtained from National Park Service..
- Idaho Department of Environmental Quality (DEQ). (2008). Idaho greenhouse gas inventory and reference case projections 1990-2020. Center for Climate Strategies.
- Idaho Department of Environmental Quality (DEQ). (2014). Idaho's 2012 Integrated Report. Boise, Idaho.
- Idaho Department of Fish and Game (IDFG). (2003). Unpublished survey or observation data from Idaho Department of Fish and Game.
- Idaho Department of Fish and Game (IDFG). (2005). Idaho comprehensive wildlife conservation strategy, Appendix F: species accounts and distribution maps for Idaho species of greatest conservation need. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, Idaho. <http://fishandgame.idaho.gov/cms/tech/CDC/cwcs.cfm>.
- Idaho Department of Fish and Game (IDFG). (2010). Bighorn sheep management plan 2010. Idaho Department of Fish and Game, Boise, Idaho.
- Idaho Department of Fish and Game (IDFG). (2013). Bighorn sheep observation data (1968 - 2013). Idaho Department of Fish and Game, Jerome, Idaho.
- Idaho Department of Fish and Game (IDFG) & Nez Perce Tribe. (2014). 2013 Idaho wolf monitoring progress report. Idaho Department of Fish and Game, Boise, Idaho; Nez Perce Tribe Wolf Recovery Project, Lapwai, Idaho.
- Idaho Sage-grouse Advisory Committee (ISAC). (2006). Conservation plan for the greater sage-grouse in Idaho. Idaho Department of Fish and Game.
- Idaho State Conservation Effort. (1996). Habitat conservation assessment and conservation strategy for the Idaho dunes tiger beetle. Report no. 7, Boise, Idaho.



- Intergovernmental Panel on Climate Change (IPCC). (2007). Climate change 2007: mitigation of climate change, Metz, B., O. R. Davidson, P. R. Bosch, R. Dave, & L. A. Meyer (eds.).
- Johnson, D.H. (1980). The comparison of usage and availability measurements for evaluating resource preference. *Ecology* 61, 65–71.
- Johnson, K. A., & Johnson, D. E. (1995). Methane emissions from cattle. *Journal of Animal Science* 73(8):2483-2492.
- Jurs, L., & Sands, A. (2004). An Inventory, Assessment, and Recommended Management of Sagebrush Steppe Vegetation in Laidlaw Park, Little Park, and Paddelford Flat, Craters of the Moon National Monument and Preserve, Idaho.
- Kaltenecker, G. S., Moser, A. M., & Bond, L. (2006). Assessment of habitat for sagebrush steppe dependent birds at Craters of the Moon National Monument and Preserve. Idaho Bird Observatory, Boise State University, Boise, Idaho.
- Keller, B., & Saathoff, R. T. (1996). A netting survey of water and cave areas used by bats at Craters of the Moon National Monument, Butte County, Idaho. Unpublished report from Idaho Museum of Natural History.
- Kerlinger, P. (1995). How Birds Migrate. Stackpole Books, Mechanicsburg, Pennsylvania.
- Klebenow, D. A. (1969). Sage-grouse nesting and brood habitat in Idaho. *Journal of Wildlife Management* 33, 649-662.
- Klemmedson, J. O., & Smith, J. G. (1964). Cheatgrass (*Bromus tectorum* L.). *Botanical Review*. 30(2), 226-262.
- Knick, S. T., Dobkin, D. S., Rotenberry, J. T., Schroeder, M. A., Vander Haegen, W. M., & Van Riper III, C. (2003). Teetering on the edge or too late? Conservation and research issues for avifauna of sagebrush habitats. *Condor* 105, 611-634.
- Kuntz, M., Champion, D. E., Spiker, E. C., Lefebvre, R. H., & McBromme, L. (1996). The Great Rift and the Evolution of the Craters of the Moon Lava Field, Idaho.
- Kuntz, M., Skipp, B., Chamion, D. E., Gans, P. B., Van Sistine, D. P., & Snyders, S. R. (2007). Geologic Map of the Craters of the Moon 30' X 60' Quadrangle, Idaho.
- Laycock, W. A. (1967). How Heavy Grazing and Protection Affect Sagebrush-Grass Ranges. *Journal of Range Management*, 20(4), 206-213. Retrieved from <http://www.jstor.org/stable/3896253>.
- Laycock, W. A. (1979). Management of Sagebrush. *Rangelands*, 1(5), 207-210. Retrieved from <http://www.jstor.org/stable/3900320>.
- Lee, J. (2002). Personal communication.
- Leu, M., & Hanser, S. E. (2011). Influences of the human footprint on the sagebrush landscape patterns: implications for sage-grouse conservation. S.T. Knick and J.W. Connelly (editors). Greater Sage-Grouse: Ecology and Conservation of a Landscape Species and its Habitats. *Studies in Avian Biology*, 38, 253–272. University of California Press, Berkeley, California. Long, Jonathan W.; Quinn-Davidson, Lenya; Skinner, Carl N., eds.

2014. Science synthesis to support socioecological resilience in the Sierra Nevada and southern Cascade Range. Gen. Tech. Rep. PSW-GTR-247. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 231–232 p.
- Louter, D. (1992). Craters of the Moon National Monument: An Administrative History. National Park Service, Pacific Northwest Region. Seattle, Washington.
- Makela, P., & Major, D. (2012). A framework to identify greater sage-grouse preliminary priority habitat and preliminary general habitat for Idaho. BLM Idaho State Office, Boise, Idaho.
- Manier, D. J., Wood, D. J. A., Bowen, Z. H., Donovan, R., Holloran, M. J., Juliusson, L. M., & Mayne, K. S. (2013). Summary of science, activities, programs and policies that influence the rangewide conservation of greater sage-grouse (*Centrocercus urophasianus*). United States Geological Survey open-file report 2013-1098, Fort Collins, Colorado.
- Marra, P., Griffing, S., Caffrey, C., Kilpatrick, A. M., McLean, R., Brand, C., Saito, E., Dupuis, A. P., Kramer, L., & Novak, R. (2004). West Nile Virus and Wildlife. *BioScience*, 54(5), 393-402.
- Meays, C. L., Laliberte, A. S., & Doescher, P. S. (2000). Defoliation Response of Bluebunch Wheatgrass and Crested Wheatgrass: Why We Cannot Graze These Two Species in the Same Manner. *Rangelands*, 22(6), 16-18. Retrieved from <http://www.jstory.org/stable/4001468>.
- Meints, D. R. & Rasmussen, C. (2015). Greater Sage Grouse Aerial Lek Surveys in and around Craters of the Moon National Monument. Idaho Department of Fish and Game, Magic Valley Region, Jerome, ID..
- Miller, R. F., Knick, S. T., Pyke, D. A., Meinke, C. W., Hanser, S. E., Wisdom, M. J., & Hild, A. L. (2011). Characteristics of sagebrush habitats and limitations to long-term conservation *In*: S. T. Knick and J. W. Connelly (editors), Greater sage-grouse: Ecology and conservation of a landscape species and its habitats. *Studies in Avian Biology*, 38. University of California Press, Berkeley, California.
- Mills, L. S. (2007). Bridging applied population and ecosystem ecology with focal species concepts. *Conservation of wildlife populations*, 276–285. Blackwell Publishing, Oxford, United Kingdom.
- Monahan, W. B., & Fisichelli, N. A. (2014). Climate exposure of U.S. national parks in a new era of change. *PLoS ONE* 9(7), 1–13. Fort Collins, Colorado. DOI: 10.1371/journal.pone.0101302.
- Morrison, M. L., Marcot, B. M., & Mannan, R. W. (1998). Wildlife-habitat relationships: concepts and applications. University of Wisconsin Press, Madison, Wisconsin.
- Moseley, R., & Popovich, S. (1995). The Conservation Status of Picabo milkvetch (*Astragalus oniciformis* Barneby). Idaho Department of Fish and Game & Shoshone District Bureau of Land Management.
- Mosley, J. C., Cook, P. S., Griffis, A. J., & O’Laughlin, J. (1997). Guidelines for managing cattle grazing in riparian areas to protect water quality: review of research and best management practices policy. Idaho Forest, Wildlife and Range Policy Analysis Group, Report no. 15.

- Murgoitio, J., & Wilhelm, A. (2014). Bighorn Sheep Risk of Contact Tool Comparison of 2013 BLM Utilization and Results in Idaho. Bureau of Land Management, Idaho State Office. Unpublished Report.
- Murphy, C. (2002). The Conservation Status of *Phacelia inconspicua* (Obscure scorpion plant) in Idaho — an update. Idaho Department of Fish and Game & Upper Snake River District, Bureau of Land Management.
- Nader, G., Henkin, Z., Smith, E., Ingram, R., & Narvaez, N. (2007). Planned Herbivory in the Management of Wildfire Fuels: Grazing Is Most Effective at Treating Smaller Diameter Live Fuels that Can Greatly Impact the Rate of Spread of a Fire along with the Flame Height. *Rangelands*, 29(5), 18–24. Retrieved from <http://www.jstor.org/stable/4640320> Accessed May 2014.
- National Technical Team (NTT). (2011). National greater sage-grouse conservation measures/planning strategy. U.S. Department of Interior Bureau of Land Management (USDI BLM).
- Natural Resource Conservation Service (NRCS). (2004). Understanding Soil Risks and Hazards: Using Soil Survey to Identify Areas with Risks and Hazards to Human Life and Property. National Soil Survey Center. Lincoln NE: USDA. Retrieved April 23, 2014 from [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052508.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052508.pdf).
- Natural Resource Conservation Service (NRCS). (2013). Web Soil Survey. USDA. Retrieved January 25, 2012 from <http://websoilsurvey.nrcs.usda.gov/>.
- NatureServe. (2013). International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington VA, USA. Data current as of 12 July 2013.
- North Magic Valley Sage-grouse Local Working Group (NMV LWG). (2009). Seasonal Habitat Mapping Methodology, Habitat Sub-committee.
- North Magic Valley Sage-grouse Local Working Group (NMV LWG). (2011). Sage-grouse conservation plan. Available at <http://fishandgame.idaho.gov/public/wildlife/sageGrouse/LWGnorthMagValley.pdf>.
- Northern Great Basin Ecoregion Rapid Ecoregional Assessment. (2013). Final report, contract L10PC00483.
- Osborn, A., Vetter, R., Hartley, L., & Brown, J. (1987). Adverse Effect of Domestic Livestock Grazing on the Archaeological Resources of Capitol Reef National Park, Utah, Midwest Archaeological Center Occasional studies in Anthropology No. 20, editor F.A. Calabrese..
- Paige, C., & Ritter, S. A. (1999). Birds in a sagebrush sea. Partners in Flight, Western Working Group.
- Patterson, R. L. (1952). The sage-grouse in Wyoming. Sage Books, Denver, Colorado.
- Pellant, M., & Lysne, C. R. (2005). Strategies to enhance plant structure and diversity in crested wheatgrass seedings. USDA Forest Service Proceedings RMRS-P-38.
- Peterson, C. (2003). Personal communication.

- Peterson, J. G. (1995). Sagebrush: ecological implications of sagebrush manipulation. Montana Department of Fish, Wildlife and Parks, Helena, Montana.
- Pitt, M. D. (1986). Assessment of Spring Defoliation to Improve Fall Forage Quality of Bluebunch Wheatgrass (*Agropyron spicatum*). *Journal of Range Management*, 39(2), 175-181.
- Platts, W. S. (1991). Livestock grazing. Pages 389-423 in W.R. Meehan (ed.) Influences of forest and rangeland management on salmonid fishes and their habitat. American Fisheries Society, Special Publication 19, Bethesda, Maryland.
- Popovich, S. (2006). Checklist of Vascular Plants: Craters of the Moon National Monument and Preserve. Wildhorse Consulting, Idaho.
- Rambo, J. L., & Faeth, S. H. (1999). Effect of vertebrate grazing on plant and insect community structure. *Conservation Biology* 13, 1047–1054.
- Renfrew, R. B. & Ribic, C. A. (2003). Grassland Passerine Nest Predators Near Pasture Edges Identified on Videotape. *Auk*, 120(2), 371-383.
- Renfrew, R. B., Ribic, C. A., & Nack, J. L. (2005). Edge Avoidance by Nesting Grassland Birds: A Futile Strategy in a Fragmented Landscape. *Auk*, 122(2), 618-636.
- Rich, T. (1984). Mountain bluebird use of treeless lava flows for nest sites. *Western Birds* 15, 39-40.
- Rimbey, N., & Torrell, L. A. (2011, July). Grazing Costs: What's the Current Situation?, University of Idaho, 2011. Accessed at <http://web.cals.uidaho.edu/idaohoagbiz/files/2013/01/GrazingCost2011.pdf>.
- Sankey, J. B., Germino, M. J., & Glenn, N. F. (2009). Aeolian sediment transport following wildfire in sagebrush steppe. *Journal of Arid Environments*, 73, 912-919.
- Sather-Blair, S., Makela, P., Carrigan, T., & Anderson, L. (2000). A Framework to Assist in Making Sensitive Species Habitat Assessment for BLM-Administered Public Lands in Idaho. Idaho Bureau of Land Management. Unpublished report.
- Schroeder, M. A., Aldridge, C. L., Apa, A. D., Bohne, J. R., Braun, C. E., Bunnell, S. D., Connelly, J. W., Deibert, P. A., Gardner, S. C., Hilliard, M. A., Kobriger, G. D., McAdam, S.M., McCarthy, C.W., McCarthy, J. J., Mitchell, D. L., Rickerson, E. V., & Stiver, S. J. (2004). Distribution of sage-grouse in North America. *Condor*, 106, 363-376.
- Schuman, G. E., Ingram, L. J., Stahl, P. D., Derner, J. D., Vance, G. F., & Morgan, J. A. (2009). Soil carbon sequestration and the greenhouse effect, 2nd edition. SSSA Special Publication 57. Madison, Wisconsin.
- Shariff, A. R., Biondini, M. E., & Grygiel, C. E. (1994). Grazing Intensity Effects on Litter Decomposition and Soil Nitrogen Mineralization. *Journal of Range Management*. 47(6), 444–449. Allen Press & Society for Range Management. <http://www.jstor.org/stable/4002994>.
- Smithsonian Institute. (2003). Museum records of the National Museum of Natural History at the Smithsonian Institute, Washington D.C.

- Sohrabi, H., Ryu, J., Abatzoglou, J., & Tracy, J. (2012). Climate extreme and it's linkage to regional drought over Idaho, USA. *Nat Hazards DOI* 10.1007/s11069-012-0384-1. Retrieved [http://www.researchgate.net/publication/235702016\\_Climate\\_extreme\\_and\\_its\\_linkage\\_to\\_regional\\_drought\\_over\\_Idaho\\_USA](http://www.researchgate.net/publication/235702016_Climate_extreme_and_its_linkage_to_regional_drought_over_Idaho_USA).
- Soil Conservation Service. (1993). Soil survey manual. Ch. 3. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. [http://www.nrcs.usda.gov/wps.portal/nrcs/detail/soils/planners/&cid=nrcs142p2\\_054262](http://www.nrcs.usda.gov/wps.portal/nrcs/detail/soils/planners/&cid=nrcs142p2_054262).
- State of Idaho. (2001). Noxious Weeds Rules. Idaho Administrative Code. Department of Agriculture. IDAPA 02.06.22.
- Stevens, B.S. (2011). Impacts of fences on greater sage-grouse in Idaho: collision, mitigation, and spatial ecology. Thesis. University of Idaho.
- Stevens, B. S., Connelly, J. W., & Reese, K. P. (2012). Multi-scale assessment of Greater Sage-Grouse fence collision as a function of site and broad scale factors. *Journal of Wildlife Management*. 76, 1370-1380.
- Stiver, S. J., Rinkes, E. T., & Naugle, D. E. (2010). Sage-grouse habitat assessment framework. U.S. Bureau of Land Management. Unpublished report. Idaho State Office, Boise, Idaho.
- Stiver, S.J., E.T. Rinkes, D.E. Naugle, P.D. Makela, D.A. Nance, and J.W. Karl, eds. (2015). Sage-Grouse Habitat Assessment Framework: A Multiscale Assessment Tool. Technical Reference 6710-1. Bureau of Land Management and Western Association of Fish and Wildlife Agencies, Denver, Colorado..
- Strand, E. K., & Launchbaugh, K. L. (2013, April). Livestock Grazing Effects on Fuel Loads for Wildland Fire in Sagebrush Dominated Ecosystems. Great Basin Fire Science Delivery Report.
- Taylor, A. R., & Tuttle, M. D. (2007). Water for wildlife: a handbook for ranchers and range managers. Bat Conservation International.
- Tisdale, E. W., Hironaka, M., & Fosberg, M.A. (1965, May). An Area of Pristine Vegetation in Craters of the Moon National Monument, Idaho. *Ecology*, 46(3), 349-352. Ecological Society of America. <http://www.jstor.org/stable/1936343>.
- Torell, L. A., Tanaka, J. A., Rimbey, N., Darden, T., Van Tassell, L., & Harp, A. (2002). Ranch-Level impacts of changing grazing policies on BLM land to protect the greater sage-grouse: evidence from Idaho, Nevada and Oregon (Policy Paper SG-01-02). Caldwell, ID, USA: Policy Analysis Center for Western Public Lands.
- Trimble, S. (1989). The Sagebrush Ocean. University of Nevada Press, Reno, Nevada.
- University of Idaho Extension Enterprise Budgets. <http://web.cals.uidaho.edu/idahoagbiz/enterprise-budgets/>, accessed April 2014.
- United States Department of Agriculture (USDA). National Agricultural Statistics Service Data. [http://www.nass.usda.gov/Statistics\\_by\\_State/](http://www.nass.usda.gov/Statistics_by_State/), accessed April 2014.
- United States Department of Agriculture (USDA). Forest Service. (2010) Final Supplemental Environmental Impact Statement. USDA, Forest Service, Intermountain Region. Written

to supplement the Southwest Idaho Ecogroup Land Resource Management Plans Final Environmental Impact Statement (FEIS) completed in 2003. Written to add direction to the 2003 Payette National Forest Land and Resource Management Plan that would provide for viability of bighorn sheep. .

United States Department of Agriculture (USDA). Forest Service. (2013) Bighorn Sheep Risk of Contact Tool User Guide. McCall, Idaho: USDA Forest Service Bighorn Sheep Working Group, Critigen Inc., 2013.. .

United States Department of Commerce (USDC), Bureau of Economic Analysis, Regional Economic Information System. (2012). Tables CA05, CA05N, & CA45. Washington, D.C.

United States Department of the Interior (USDI). (2006). Riparian area management: grazing management processes and strategies for riparian-wetland areas. Technical reference 1737-20. BLM/ST/ST-06/002+1737. Bureau of Land Management, National Science and Technology Center, Denver, Colorado.

U.S. Department of the Interior, Bureau of Land Management (USDI BLM). (1980). Great Rift Proposed Wilderness Final Environmental Impact Statement.

United States Department of the Interior, Bureau of Land Management (USDI BLM). (1986). BLM Manual Handbook 8431-1 – Visual Resource Contrast Rating..

United States Department of the Interior, Bureau of Land Management (USDI BLM). (1986). BLM Manual Handbook 8410-1 – Visual Resource Inventory..

United States Department of the Interior, Bureau of Land Management (USDI BLM). (1988). BLM Manual 1613 – Areas of Critical Environmental Concern..

United States Department of the Interior, Bureau of Land Management (USDI BLM). (1991). Idaho Wilderness Study Report, Volumes 1 and 3..

United States Department of the Interior, Bureau of Land Management (USDI BLM). (1997a). Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management. <http://www.blm.gov/pgdata/etc/medialib/blm/id/publications.Par.91993.File.dat/SGFinal.pdf> . Accessed April 2014.

United States Department of the Interior, Bureau of Land Management (USDI BLM). (1997b). Riparian area management: grazing management for riparian-wetland areas. USDOI, Bureau of Land Management, BLM/RS/ST-97/002+1737, National Applied Resource Sciences Center, Denver, Colorado.

United States Department of the Interior, Bureau of Land Management (USDI BLM). (1999). Utilization Studies and Residual Measurements. (Technical Reference 1734-3). National Applied Resource Sciences Center. Denver, CO: Bureau of Land Management. <http://web.nc.blm.gov/blmlibrary/techref.htm> Accessed April 2014.

United States Department of the Interior, Bureau of Land Management (USDI BLM). Habich, E. F. (2001). Ecological Site Inventory. (Technical Reference 1734-7). National Science & Technology Center. Denver, CO: Bureau of Land Management. <http://web.nc.blm.gov/blmlibrary/techref.htm>, Accessed 2014.

- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2010). Seasonal wildlife restrictions and procedures for processing requests for exceptions on public lands in Idaho. BLM Idaho State Office, Boise, Idaho.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2011, July 21). Final Supplementary Rules to Require the Use of Certified Noxious-Weed-Free Forage and Straw on Bureau of Land Management Lands in the State of Idaho. Federal Register, 76(140).
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2012). Instruction memorandum no. 2012-043: greater sage-grouse interim management policies and procedures. Washington, D.C.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (1986). BLM Manual Handbook 8410-1 – Visual Resource Inventory.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2012). BLM Manual 6310 – Conducting Wilderness Characteristics on BLM Lands.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2012). BLM Manual 6320 – Considering Wilderness Characteristics Inventory on BLM Lands.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2012). BLM Manual 6330 – Management of Wilderness Study Areas.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2013a). Internal Data, WO Instruction Memorandum No. 2013-084, 2013 Grazing Fee, Surcharge Rates, and Penalty for Unauthorized Grazing Use. Washington, D.C.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2013b). Instruction memorandum no. 2013-094: resource management during drought. Washington, D.C.
- United States Department of the Interior, Bureau of Land Management (USDI BLM). (2013). Instruction Memorandum No. 2013-111: The National Vegetation Classification and Associated Mapping Standards for Bureau of Land Management Planning Documents and Assignment of State-level Vegetation Classification Data Stewards. Washington, D.C.
- United States Department of Interior, National Park Service (USDI NPS). (2013). 2013 National Park Visitor Spending Effects: Economic Contributions to Local Communities, States, and the Nation. Natural Resource Report NPS/NRSS/EQD/NRR-2014-824. Retrieve from <http://www.nature.nps.gov/socialscience/economics.cfm> Accessed July 2014.
- United States Department of the Interior, National Park Service (USDI NPS). (2014). Climate change resource brief: recent climate change exposure of Craters of the Moon National Monument and Preserve.
- United States Department of the Interior, U.S. Fish and Wildlife Service (USFWS). (2010). Federal register notice March 5, 2010. FWS-R6-ES-2010-0018 or MO 92210-0-0008-B2. Endangered and threatened wildlife and plants; 12-month findings for petitions to list the greater sage-grouse (*Centrocercus urophasianus*) as threatened or endangered.

- United States Department of the Interior, U.S. Fish and Wildlife Service (USDI USFWS). (2012). Greater sage-grouse (*Centrocercus urophasianus*) conservation objectives: draft report. Denver, Colorado.
- United States Department of the Interior, U.S. Fish and Wildlife Service (USDI USFWS). (2013). Greater sage-grouse (*Centrocercus urophasianus*) conservation objectives: final report. U.S. Fish and Wildlife Service, Denver, Colorado.
- United States Geological Survey, Gap Analysis Program (USGS GAP). (2011). National Land Cover, Version 2.
- Valone, T. J., Meyer, M., Brown, J. H., & Chew, R. M. (2002). Timescale of Perennial Grass Recovery in Desertified Arid Grasslands Following Livestock Removal. *Conservation Biology*, 16(4), 995-1002.
- Walker, B. L., & D. E. Naugle. (2011). West Nile virus ecology in sagebrush habitat and impacts on Greater Sage-Grouse populations. *In*: S. T. Knick and J. W. Connelly (editors), Greater sage-grouse: Ecology and conservation of a landscape species and its habitats. *Studies in Avian Biology*, 38. University of California Press, Berkeley, California.
- Walker, B. L., D. E. Naugle, K. E. Doherty, & T. E. Cornish. (2007). West Nile virus and Greater Sage-Grouse: Estimating infection rate in a wild bird population. *Avian Diseases*, 51:691-696.
- Welch, B. L., Pederson, J. C., & Rodriguez, R. L. (1988). Selection of big sagebrush by sage-grouse. *Great Basin Naturalist* 48, 274-279.
- Welch, B. L., Wagstaff, F. J., & Roberson, J. A. (1991). Preference of wintering sage-grouse for big sagebrush. *Journal of Range Management*, 44, 462-465.
- Westenskow-Wall, K. J., Krueger, W. C., Bryant, L. D., & Thomas, D. R. (1994). Nutrient Quality of Bluebunch Wheatgrass Regrowth on Elk Winter Range in Relation to Defoliation. *Journal of Range Management*, 47, 240-244.
- Western Watersheds Project v. Ken Salazar, Secretary, Department of the Interior. 4:08–CV-516–BLW (District of Idaho, 2012).
- Western Watersheds Project v. Ken Salazar, Secretary, Department of the Interior. Declaration of Brent E. Ralston. 4:08–CV-516–BLW (District of Idaho, 2012).
- Whipple, J. (1992). Review of Herbarium Plant List. Crater of the Moon Herbarium.
- Whisenant, S. G. (1990, November). Changing Fire Frequencies on Idaho's Snake River Plains: Ecological and Management Implications. Proceedings — Symposium on Cheatgrass Invasion, Shrub Die-off, and Other Aspects of Shrub Biology and Management. (General Technical Report INT-276). USDA Forest Service.
- Whittington, D. M., & Allen, G. T. (2008). Draft guidelines for raptor conservation in the western United States. U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Washington, D.C.
- Wildesen, L. E. (1982). The Study of Impacts on Archaeological Sites, *Advances in Archaeological Methods and Theory*, 5, 51-96. Academic Press, Inc..



- Wilkins, R. N., Brown, R. D., Conner, R. J., Engle, J., Gilliland, C., Hays, A., Slack, R. D., & Steinbach, D. W. (2003). *Fragmented lands: Changing land ownership in Texas*. Texas A&M University, College Station.
- Williams, B. K., Szaro R. C., & Shapiro, C. D. (2009). *Adaptive management: the U.S. Department of the Interior technical guide*. Adaptive Management Working Group, U.S. Department of the Interior, Washington, D.C.
- Williams, R. (2002). U.S. Department of Agriculture, Wildlife Services, Arco, Idaho. Personal communication.
- World Resources Institute. (2014). *Climate analysis indicators tool*. <http://cait2.wri.org>.
- Yingst, D., & Handy, H. M. (1961). *Research Island? Our Public Lands*. Bureau of Land Management. 11(1).

## **Appendix B. Management Common to All Alternatives - Carried forward from the 2007 Craters of the Moon MMP**

Much of the Management Guidance in the 2007 Plan is carried forward and will continue to apply regardless of alternatives. The actions described in Appendix B would be implemented regardless of which alternative is ultimately selected. This section compiles common direction in one place so that the reader can focus on the actual differences among alternatives. Laws, regulations, and policies drive a large portion of BLM's work. Agencies frequently do not have much latitude to vary proposed management across alternatives and still comply with those laws, regulations, and policies.

### **Soil Resources Management Actions**

SOIL-1: Soils would be protected from accelerated or unnatural erosion from ground disturbing activities.

SOIL-2: The potential for, or presence, extent and condition of, biological soil crusts would be investigated to provide specific management guidance.

SOIL-3: Biological soil crusts would be considered in management decisions where appropriate.

### **Water Resources Management Actions**

WATER-1: No additional playas would be modified or developed.

WATER-2: Playas would be evaluated for restoration on a case-by-case basis.

WATER-3: The agencies would work with appropriate State of Idaho authorities to obtain water resources needed for Monument purposes.

### **Vegetation, Including Special Status Species, and Fire Management Actions**

VEG-1: To protect vegetation resources, no new livestock developments will be permitted in Bowl Crater Allotment or the North Pasture of Laidlaw Park Allotment unless they result in a net benefit to those resources identified as needing improvement or protection.

VEG-2: Existing sagebrush steppe communities will be protected to prevent loss of shrub cover and managed to promote a diverse, desirable grass and forb understory .

VEG-3: Annual grasslands and highly degraded sagebrush steppe communities will be restored to achieve a mosaic of shrubs, forbs, and grasses capable of sustaining native animal populations.

VEG-4: Restoration projects will be prioritized relative to locations of key greater sage-grouse habitat and population strongholds. Emphasis will be on projects that restore annual grasslands and degraded sagebrush steppe communities, as well as enlarging and connecting habitats in good condition.

VEG-5: National and Idaho state habitat guidelines for greater sage-grouse and sagebrush steppe obligates developed by interagency working groups regarding composition and structure of sagebrush habitats on a landscape scale will be adopted to guide sagebrush steppe management.

VEG-6: Current science and best available technologies and plant material will be considered in analysis and implementation of all restoration projects. Restoration treatments may be active or passive and may include, but are not limited to, the following: prescribed fire, thinning, mowing, herbicide treatment, seeding, temporary removal of livestock and/or changes in grazing regimes or facilities, and road closures.

VEG-7: Areas classified as poor to fair biotic integrity will be highest priority for restoration treatments.

VEG-8: Aggressive protection of existing sagebrush steppe communities and proactive restoration of areas with poor to fair biotic integrity through both active and passive means will be emphasized.

VEG-9: Approximately 80,000 acres of BLM-administered land will be restored. About 31,000 acres of annual grassland and 49,000 acres of highly degraded low elevation sagebrush steppe (poor to fair biotic integrity) will be treated to control cheatgrass and restore big sagebrush cover.

VEG-10: All special status species in the Monument will be inventoried with monitoring plans established, particularly when and where, adverse impacts may occur.

VEG-11: Actions and stipulations necessary to protect special status species and their habitats will be made part of land use authorizations (e.g., limiting fragmentation of special status species populations when considering road maintenance) and fire planning.

VEG-12: Use of native plants will be emphasized in rehabilitation and restoration projects, and only native plants will be used for rehabilitation or restoration projects within the Pristine Zone. Integrated weed management principles will be used to:

- Detect and eradicate all new infestations of noxious weeds;
- Control existing infestations; and
- Prevent the establishment and spread of weeds within and adjacent to the planning area.

VEG-13: Weed infestations in wilderness areas will be controlled by methods consistent with minimum tool requirements and integrated weed management principles, including prevention of disturbance activities, use of chemical and mechanical methods to control or physically remove noxious weeds, and selective application of herbicides and possibly biological controls.

VEG-14: Integrated weed management principles will be applied proactively throughout all zones. This program will emphasize protection of weed-free areas and aggressive detection and control of noxious or highly invasive exotic weeds and will include an analysis of the trade-offs involved in herbicide use versus non-chemical methods of weed control.

VEG-15: Only certified weed-free hay, straw, and mulch will be permitted within the Monument.

VEG-16: Wildland fires will be suppressed to protect life and property, healthy sagebrush steppe communities, recent rehabilitation and restoration projects, cultural sites, and the Little Cottonwood Creek watershed.

VEG-17: Fire will be managed to maximize protection and restoration of sagebrush steppe in the Passage and Primitive Zones.

VEG-18: Wildland fire use will be allowed in the Wilderness and Preserve except when incompatible with resource management objectives or if there is a danger to life or property.

VEG-19: Limited prescribed fire (<500 acres) will be used in the aspen, conifer, and mountain shrub vegetation types to improve wildlife habitat and invigorate plant communities while protecting the Little Cottonwood watershed.

VEG-20: In the event of wildland fire, burned areas will be rehabilitated when necessary to restore the appropriate mosaic of sagebrush species and subspecies, along with a diverse perennial understory, and to suppress invasive and noxious weeds.

VEG-21: The cooperative arrangement between the Bureau of Land Management and the National Park Service related to fire management will continue, including cooperative agreements with local fire departments and rural fire districts.

VEG-22: The Bureau of Land Management and the National Park Service will develop a joint fire management implementation plan for the Monument.

VEG-23: The network of main arterial roads will be managed to support access for wildland fire suppression.

### **Wildlife Management Actions**

WLIFE-1: Inventory and monitoring of wildlife will emphasize species that are regionally or nationally important.

WLIFE-2: A monitoring program will be established to detect species populations in decline and species as indicators of the health of the ecosystem, and to record the presence of species of special concern.

WLIFE-3: The NPS, in consultation with the State and Tribes, will designate areas within the Preserve and periods of time when no hunting will be permitted for protection of the area's resources.

WLIFE-4: On all NPS-administered lands, predator control will not be authorized by the Park Service except on a case-by-case basis.

WLIFE-5: Native animal species identified as pests will be managed in accordance with the applicable BLM or NPS management policies depending upon the administrative area in which the pest occurs.

WLIFE-6: All special status species in the Monument will be inventoried with monitoring plans established, particularly when and where adverse impacts may occur.

WLIFE-7: Actions and stipulations necessary to protect special status species and their habitats will be made part of land use authorizations (e.g. limiting fragmentation of special status species populations when considering road maintenance) and fire planning.

WLIFE-8: Active and historic leks will be protected from disturbance during the sage-grouse breeding season. Some examples of potential protection measures as presented in the Idaho

Sage-grouse Advisory Committee's 2006 Conservation Plan for the Greater Sage-grouse in Idaho include:

- Apply use restrictions where needed and appropriate on existing roads or trails near occupied leks to minimize nonessential activity between 6 PM and 9 AM (in general this guideline should be applied from approximately March 15 through May 1).
- Avoid human activities such as fence maintenance or construction or any project or related work at or near (1 km or 0.6 mile) occupied leks that results in or will likely result in disturbance to lekking birds, between 6 PM and 9 AM (in general this guideline should be applied from approximately March 15 through May 1).
- Avoid creating unnecessary disturbance related to livestock management activities near occupied leks whenever possible.
- Improve the dissemination of information to elementary and high school students, hunters, resource user-groups, and others to increase their understanding of sage-grouse and sagebrush steppe conservation issues.
- Monitor leks in a manner that minimizes disturbance to sage-grouse following established protocol (Idaho Sage-grouse Advisory Committee 2006, Sections 5.2.1.1 and 5.2.1.2).

WLIFE-9: Consistent with Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management (USDI BLM 1997) determinations, livestock grazing management will be modified as necessary to ensure key sage-grouse habitat achieves site potential.

WLIFE-10: The BLM will continue to hold annual meetings and coordinate closely with U.S. Department of Agriculture, Wildlife Services Program, and livestock lessees to reduce livestock losses. The BLM will encourage non-lethal methods, education, and the targeting of specific offending animals for lethal methods. These procedures will be implemented to protect both public safety and the natural resources for which the Monument was designated.

### **Livestock Grazing Management Actions (Revisited in this amendment)**

GRAZ-1: Nine allotment boundaries will be altered to accurately reflect the NPS/BLM boundary. There will be no change in AUM preferences actually available for grazing.

GRAZ-2: BLM land available for livestock use totals approximately 273,900 acres. BLM land not available for livestock use totals approximately 1,200 acres. NPS land not available for livestock use totals approximately 463,300 acres. (These acre values were updated using the best available information and GIS data; however, this statement has the same intent as GRAZ-2 of the 2007 MMP.)

GRAZ-3: Permitted livestock use totals 36,965 animal unit months. (Corrected AUMs are calculated at 38,187 AUMs since the 2007 MMP estimate.) The current livestock use authorizations will be maintained until Idaho Standards for Rangeland Health evaluations or similar NEPA-compliance decisions identify the need for adjustments in livestock use to meet standards, vegetation, livestock, or resource objectives.

GRAZ-4: Use of existing livestock developments in Primitive and Pristine Zones may continue. The BLM may remove developments if they are no longer serving a useful purpose or resource objectives warrant their removal. Sites will be restored.

GRAZ-6: There will be no new livestock developments permitted in Bowl Crater Allotment or the North Pasture of Laidlaw Park Allotment unless they result in a net benefit to those resources identified as needing improvement or protection.

### **Cultural Resources Management Actions**

CULT-1: A comprehensive Archaeological Overview and Assessment of known and potential archaeological resources (baseline research report) within the planning area will be completed.

CULT-2: A Cultural Resource Management Plan that describes how specific sites will be managed, defines what areas need additional inventory, and designates potential use categories for sites will be completed for the Monument.

CULT-3: Measures such as access limitations and periodic monitoring will be identified to proactively manage and protect cultural resources, including traditional cultural properties.

CULT-4: Projects will be planned and designed so as to avoid adversely impacting cultural resources where possible. The BLM and the NPS will consult with Tribes and the Idaho State Historic Preservation Officer (SHPO) to develop alternatives to avoid, minimize, or mitigate any potential adverse effects.

CULT-5: Through consultation with the Idaho SHPO, areas for Section 110 cultural resource inventories will be prioritized.

CULT-6: A proactive Section 110 inventory will be conducted as funding allows, expanding the cultural resource database for the Monument.

CULT-7: A minimum of 10% of the Monument will be inventoried for cultural resources over the life of the plan. The focus of the Section 110 Inventory will be in the Primitive and Passage Zones.

CULT-8: The significance of known archaeological and historic resources, structures, and landscapes will be evaluated and documented, in conjunction with the Idaho SHPO, for listing on the National Register.

CULT-9: Activities that may affect the Goodale's Cutoff of the Oregon Trail, the NPS headquarters/visitor center Mission 66-era, or other properties listed or eligible for the National Register will be undertaken in consultation with the Idaho SHPO.

CULT-10: At-risk National Register eligible sites will be monitored for vandalism or other disturbances and protected/stabilized as necessary.

CULT-11: National Register eligible properties will be monitored periodically and steps will be taken to stabilize any property found to be deteriorating and to limit access as needed.

CULT-12: The agencies will pursue more public education and interpretation off site, with increased monitoring and protection for those sites at risk.

### **Native American Rights and Interests Management Actions**

NAAM-1: Native American Tribes that have expressed an interest in traditional cultural properties within the Monument will be consulted on a regular basis regarding the management of those properties.

NAAM-2: Handling of Native American Graves Protection and Repatriation Act materials will be addressed as a component of a Cultural Resources Management Plan.

NAAM-3: Should any Native American Graves Protection and Repatriation Act material ever be inadvertently discovered within the Monument, the agencies will follow the tribal consultations procedures outlined in the Act regarding their treatment.

NAAM-4: The agencies in consultation with the Tribes will identify protection measures for any places of traditional cultural importance to Native Americans to preserve the integrity and use of those areas as described in National Register Bulletin 38.

NAAM-5: Agencies will consult with associated Native American tribes to develop and accomplish the programs of the Monument in a way that respects their beliefs, traditions, and other cultural values.

NAAM-6: Agencies will consult with Native American tribes prior to taking actions that will affect natural and cultural resources that are of interest and concern to them.

NAAM-7: Hunting, gathering, and the use of certain natural resources as sacred objects for religious use will continue on the Preserve and the expanded areas of the Monument.

#### **Visual Resources Management Actions**

VRM-1: BLM and NPS managers should seek the cooperation of visitors, neighbors, and local government agencies to prevent or minimize impacts and prevent the loss of western landscape vistas and natural dark conditions.

VRM-2: Existing waste dumps will be inventoried and cleaned up.

VRM-3: VRM inventory classes will be designated as management classes.

#### **Wilderness and Wilderness Study Areas Management Actions**

WILD-1: NPS and BLM will develop a joint Wilderness/Wilderness Study Area (WSA) Management Plan following the completion of this plan. No additional wildlife water developments or other habitat manipulations will be undertaken to manage wildlife populations in Wilderness, Wilderness Study Areas, or the Preserve.

WILD-2: As part of the joint Wilderness/WSA Management Plan, and consistent with current guidance on inventorying for and managing to protect or enhance wilderness characteristics, the agencies may conduct additional inventory, consider citizen proposals, and consider protections of lands with wilderness characteristics.

WILD-3: Minimum requirement analysis will precede any proposed management activities within designated wilderness areas and WSAs will continue to be managed under the guidance of the Interim Management Policy for Lands under Wilderness Review (replaced in 2012 by Manual 6330 Management of Wilderness Study Areas).

WILD-4: Use of aircraft to survey and monitor wildlife populations could be continued, but flights will be scheduled to avoid high visitor use periods. Any landing of aircraft or dropping of supplies from aircraft in wilderness or WSAs will be consistent with a minimum requirement and minimum analysis.

WILD-5: Ways or travel routes within WSAs not identified during wilderness inventories will be closed to motorized vehicles and rehabilitated.

WILD-6: Should Congress release any Wilderness Study Area from WSA status, then the area will be managed under the direction of this land use plan.

### **Travel and Transportation Management Actions**

Eighteen travel and transportation management actions were established in the 2007 Monument Management Plan. The 2007 Plan directed that a comprehensive travel management plan be written as an implementation-level plan. The management zones, road and trail classification system, and other provisions of the Monument Management Plan provided the framework for developing the Comprehensive Travel Plan, which was completed in 2009. It is now the most current management specific to travel and transportation in the Monument.

Actions specific to the Comprehensive Travel Plan include:

- Maintain roads, as defined on page 2 of the travel plan, to a consistent standard to support wildfire operations,
- Seasonally close routes in big game winter habitat when needed,
- Seasonally close and limit routes to protect sage-grouse,
- Restrict occupancy in areas of known active sage-grouse leks during the breeding season,
- Limit some Primitive Roads to administrative use only in order to minimize human-caused wildfire threats and the spread of non-native invasive plants and noxious weeds,
- Allow administrative use only on some routes to Monument infrastructure such as range improvements associated with grazing and livestock operations, wildlife management, and enclosures,
- Construct vehicle parking areas in order to minimize human-caused wildfire threats and the spread of non-native invasive plants and noxious weeds,
- Close and remove/rehabilitate some Primitive Roads in the Pristine Zone to protect archaeological and geological resources,
- Provide access for motorized and non-motorized recreational activities,
- Develop and analyze a ‘toolbox’ of options for route closures, and
- Protect valid existing rights.

### **Visitor Use Management Actions**

VISIT-1: A Long-Range Interpretive Plan for the Monument will be developed.

VISIT-2: Both agencies will coordinate services to meet the needs of permittees, visitors, students, educators, interest groups, and the general public.



VISIT-3: Monument staff will continue to promote visitor safety and resource protection. Designated roads, trails, and facilities will be maintained, and new facilities will be provided as appropriate in the Frontcounty Zone for resource protection and visitor enjoyment.

VISIT-4: Developed facilities such as the visitor center at the original NPS Monument will continue to be provided. Informational/orientation materials dealing with recreation, maps, safety, and resource concerns will be posted on kiosks located at all primary backcountry access points surrounding the Monument and at the Carey and Kimama BLM fire stations.

VISIT-5: Interpretive programs and the maintenance of exhibits and waysides will continue.

VISIT-6: Educational programs for schools will focus on programs on-site in the original NPS-administered Monument. A number of programs (summer and winter) aimed at special users will be presented each year.

VISIT-7: Educational programs will be expanded to off-site locations.

VISIT-8: A variety of interpretive media for on- and off-site use will continue to be developed.

VISIT-9: Interpretive signs will be provided along the US 20/26/93 corridor.

VISIT-10: Interpretation outside the Frontcounty Zone will emphasize publications, web sites, exhibits, and other off-site interpretive media.

VISIT-11: Interpretive emphasis will be on providing new interpretive and educational materials and programs outside the expanded portion of the Monument and in partnering communities and facilities.

VISIT-12: A variety of portable media (maps, tapes, guidebooks, etc.) will be developed to interpret the expanded portion of the Monument.

VISIT-13: Informational/orientation material dealing with recreation, maps, safety, and resource concerns will be available in gateway communities. Visitor center(s) operated in cooperation with local partners will be proposed within the I-84 corridor.

VISIT-14: Commercial outfitters and guides will be encouraged to offer a range of guided experiences. Visitors who might not otherwise have the proper knowledge, vehicles, or preparation to experience the interior of the Monument will then have a viable option that will not require a lot of road, trail, and facility improvement.

VISIT-15: Safety and resource protection will be emphasized at all access points.

### **Socioeconomic Values Management Actions**

SOCIO-1: An intergovernmental coordination group will be considered to ensure consistency of this plan with other state and local plans.

SOCIO-2: The agencies will participate with interested communities in their planning for accommodating Monument visitors through their communities.

# **Appendix C. Idaho and Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment Attachment 1– Chapter 2, and Required Design Features**

Below is an excerpt from Chapter 2 of Attachment 1 of the Idaho and Southwestern Montana ARMPA for reference purposes. The guidance in this document is common to all Craters of the Moon National Monument draft Plan Amendment alternatives. For more details, please see the original document.

## **CHAPTER 2**

### **APPROVED RESOURCE MANAGEMENT PLAN AMENDMENT**

#### **2.1 Approved Resource Management Plan Amendment Instructions**

This ARMPA is now the baseline plan for managing GRSG in Idaho and southwestern Montana in the following district offices: Boise, Twin Falls, and Idaho Falls in Idaho and Western Montana in Montana. The ARMPA adopts the management described in the Idaho and Southwest Montana Greater Sage- Grouse Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (2015), with modifications and clarifications as described in the *Modifications and Clarifications* section of the record of decision (ROD).

In the event there are inconsistencies or discrepancies with previously approved RMPs, this ARMPA's decisions will be followed, unless there are more restrictive decisions in the existing plans. The BLM will continue to tier to statewide, national, and programmatic EISs and other NEPA and planning documents and will apply RDFs or other management protocols in other planning documents after appropriate site- specific analysis.

All future resource authorizations and actions in GRSG habitat will conform to or be consistent with the decisions contained in this ARMPA. All existing operations and activities authorized under permits, contracts, cooperative agreements, or other authorizations will be modified, as necessary and appropriate, to conform to this plan amendment within a reasonable time frame. However, this ARMPA does not repeal valid existing rights on public lands. A valid existing right is a claim or authorization that takes precedence over the decisions developed in this plan. If such authorizations come up for review and can be modified, they will also be brought into conformance with this plan amendment, as appropriate.

While the Final EIS for the Idaho and Southwestern Montana Proposed GRSG RMP Amendment constitutes compliance with NEPA for the broad-scale decisions made in this ARMPA, the BLM will continue to prepare environmental assessments (EAs) and EISs where appropriate as part of implementation level planning and decision-making.

#### **2.2 Goals, Objectives, and Management Decisions**

*Appendix C Idaho and Southwestern Montana  
Greater Sage-Grouse Approved Resource  
Management Plan Amendment Attachment 1–  
Chapter 2, and Required Design Features*

This section of the ARMPA presents the goals, objectives, land use allocations, and management actions established for protecting and preserving Greater Sage-grouse and its habitat on public lands managed by the BLM in Idaho and Southwestern Montana. These management decisions are presented by program area. Not all types of decisions were identified for each program. Land use allocations are depicted in Appendix A. A Monitoring Framework is also included (in Appendix D) to describe how the implemented program decisions will be monitored.

This section is organized by program area beginning with the Special Status Species (SSS) program, which identifies specific goals, objectives, and management actions for Greater Sage-grouse and its habitat. For ease of identification into the future, each program area has identified abbreviations (see below) for these program areas and each decision in that program is numbered in coordination with the abbreviation:

- Special Status Species (SSS)
  - GRSG Management Areas
  - Adaptive Management
  - Anthropogenic Disturbance
  - Monitoring
- Vegetation (VEG)
  - Sagebrush Steppe
  - Conifer Encroachment
  - Invasive Species
  - Riparian and Wetlands
- Fire and Fuels Management (FIRE)
  - Pre-suppression
  - Suppression
  - Fuels Management
  - Post-Fire Management
- Livestock Grazing (LG)
- Wild Horses and Burros (WHB)
- Minerals Resources (MR)
  - Fluid Minerals
  - Locatable Minerals
  - Salable Minerals

- Non-Energy Leasable Minerals
- Mineral Split Estate
- Renewable Energy (Wind and Solar) (RE)
- Livestock Grazing (LG)
- Lands and Realty (LR)
  - Utility Corridors and Communication Sites
  - Land Use Authorizations
  - Land Tenure
  - Recommended Withdrawals
- Recreation and Visitor Services (REC)
- Travel and Transportation (TTM)
- Mitigation (Montana)
- Coordination

Table 2.1 is a summary of the allocation decisions presented for each GRSG habitat management area.

Table 2-1 Summary of Allocation Decisions by GRSG Habitat Management Areas

Resource	PHMA	IHMA	GHMA
Land Tenure	Retain	Retain	Retain
Solar	Exclusion	Avoidance	Idaho – Open Montana- Avoidance
Wind	Exclusion	Avoidance	Idaho – Open Montana- Avoidance
Major ROWs	Avoidance	Avoidance	Open Montana - Avoidance
Minor ROWs	Avoidance	Avoid	Open
Oil and Gas	Open with Major Stipulations	Open with Major Stipulations	Open with Controlled Surface use and Standard Stipulations
Geothermal	Open with Major Stipulations	Open with Major Stipulations	Open with Controlled Surface use and Standard Stipulations
Non-energy Leasables	Closed	Open	Open
Salable Minerals	Closed	Open	Open
Locatable Minerals	SFA = Recommend Withdrawal Other PHMA = Open	Open	Open

Travel Management	Limited	Limited	Idaho –Limited Montana Limited to Designated (see Dillon RMP)
Livestock Grazing	Open	Open	Open

### 2.2.1 Special Status Species (SSS)

Goal SSS 1: Maintain and/or increase the abundance, distribution and connectivity of GRSG by conserving, enhancing and restoring GRSG habitat to maintain resilient populations by reducing, eliminating or minimizing threats to GRSG habitats.

Goal SSS 2: Provide for the needs of GRSG and their habitat while also providing for resource uses in accordance with BLM's direction for multiple use and sustained yield as described in FLPMA.

Goal SSS 3: Manage anthropogenic development and human disturbance to minimize the likelihood of adverse population level effects on GRSG.

Goal SSS 4: Reduce the risk of West Nile Virus or other disease outbreaks from BLM management actions.

Goal SSS 5: Conserve, enhance, and restore the sagebrush ecosystem upon which GRSG populations depend in an effort to maintain and/or increase their abundance and distribution, in cooperation with other conservation partners.

Objective SSS 1: Maintain or make progress toward all lands within PHMA and IHMA (at least 70%) capable of producing sagebrush so there is a minimum of 15 percent sagebrush cover and conifers absent to uncommon within 1.86 miles of occupied leks.

Objective SSS 2: Incorporate GRSG Seasonal Habitat Objectives (Table 2.2), into the design of projects or activities, as appropriate, based on site conditions and ecological potential, unless achievement of fuels management objectives require additional reduction in sagebrush cover to meet strategic protection of GRSG habitat and conserve habitat quality for the species or at least one of the following conditions can be demonstrated and documented in the NEPA analysis associated with the specific project:

- A specific objective is not applicable to the site-specific conditions of the project or activity;
- An alternatives objective is determined to provide equal or better protection for GRSG or its habitat (based on appropriate scientific findings); or
- Analysis concludes that following a specific objective will provide no more protection to GRSG or its habitat than not following it, for the project being proposed.
- These habitat objectives in Table 2–2 summarize the characteristics that research has found represent the seasonal habitat needs for GRSG. The specific seasonal components identified in the table were adjusted based on local science and monitoring data to define the range of characteristics used in this subregion. Thus, the habitat objectives provide the broad vegetative conditions we strive to obtain across the landscape that indicate the seasonal habitats used by GRSG. These habitat indicators are consistent with the rangeland health indicators used by the BLM.

- The habitat objectives will be part of the GRSG habitat assessment to be used during land healthy evaluations (see Appendix D, Monitoring Framework). These habitat objectives are not obtainable on every acre within the designated GRSG habitat management areas. Therefore, the determination on whether the objectives have been met will be based on the specific sites' ecological ability to meet the desired condition identified in the table.
- All BLM use authorizations will contain terms and conditions regarding the actions needed to meet or progress toward meeting the habitat objectives. If monitoring data show the habitat objectives have not been met nor progress being made towards meeting them, there will be an evaluation and a determination made as to the cause. If it is determined that the authorized use is the cause, the use will be adjusted by the response specified in the instrument that authorized the use.

Table 2–2 Habitat Objectives for GRSG

Attribute	Indicator	Desired Condition	Reference
<b>LEK HABITAT (Seasonal Use Period March 1 – May 15)1</b>			
Lek Security	Proximity of trees	Trees (i.e., in Idaho mainly juniper, conifers, and does not include old-growth juniper, pinyon pine and mountain mahogany; in Montana mainly Douglas-fir) absent or uncommon on shrub/grassland ecological sites within 1.86 miles (3 km) of occupied leks.	Baruch-Mordo et al. 2013 <sup>7</sup> Stiver et al. 2015 <sup>13</sup>
	Proximity of sagebrush to leks	Adjacent protective sagebrush cover within 328 ft. (100 m) of an occupied lek	Stiver et al. 2015 <sup>13</sup>
<b>NESTING/EARLY BROOD REARING 1,5,10,12,13,14 (Seasonal Use Period May 1 – June 30) 1</b>			
Cover and Food	Seasonal habitat extent	>80% of the nesting habitat meets the	Connelly et al. 2000 <sup>8</sup>
	(Percent of Seasonal Habitat Meeting Desired Conditions)	recommended vegetation characteristics, where appropriate (relative to ecological site potential, etc.).	
	Sagebrush cover <sup>2</sup>	15-25%	Connelly et al. 2000 <sup>8</sup> Connelly et al. 2003 <sup>9</sup> Hagen et al. 2007 <sup>11</sup>
	Sagebrush height	12-31 inches (30-80cm)	Connelly et al. 2000 <sup>8</sup>
	Arid sites <sup>3</sup> Mesic sites <sup>4</sup>	16-31 inches (40-80cm)	
	Predominant sagebrush shape	Predominantly spreading shape <sup>5</sup>	Stiver et al. 2015 <sup>13</sup>
	Perennial grass cover (such as native bunchgrasses) <sup>2</sup>	≥10% ≥15%	Connelly et al. 2000 <sup>8</sup> Stiver et al. 2015 <sup>13</sup>
	Arid sites <sup>3</sup> Mesic sites <sup>4</sup> Perennial grass (and forb) height (includes residual grasses)	≥ 7 inches	Connelly et al. 2000 <sup>8</sup> Connelly et al. 2003 <sup>9</sup> Hagen et al. 2007 <sup>11</sup> Stiver et al. 2015 <sup>13</sup>

	Perennial forb cover <sup>2</sup>	≥5%	Connelly et al. 2000 <sup>8</sup>
	Arid sites <sup>3</sup> Mesic sites <sup>4</sup>	>10%	
	Perennial forb availability	Preferred forbs are common with several species present <sup>6</sup>	Stiver et al. 2015 <sup>13</sup>
<b>LATE BROOD-REARING/SUMMER1, 15 (July-October)1 Late brood-rearing areas, such as riparian, meadows, springs, higher elevation mesic uplands, etc. may occur within other mapped seasonal habitat areas. Apply late brood rearing/summer habitat desired conditions locally as appropriate.</b>			
Cover and	Seasonal habitat extent	>40% of the summer/brood habitat	Connelly et al. 2000 <sup>8</sup>
Food	(Percent of Seasonal Habitat Meeting Desired Condition)	meets recommended brood habitat characteristics where appropriate (relative to ecological site potential, etc.)	
	Sagebrush cover <sup>2</sup>	Uplands 10-25%  Riparian/Meadow: Sagebrush cover within 100 m	Connelly et al. 2000 <sup>8</sup>

Table 2–2 Habitat Objectives for GRSG continued

Attribute	Indicator	Desired Condition	Reference
	Sagebrush height	16 to 32 inches (40-80cm)	Connelly et al. 2000 <sup>8</sup>
	Perennial grass and forb cover <sup>2</sup>	>15%	
	Upland and riparian perennial forb availability <sup>2</sup>	Preferred forbs are common with appropriate numbers of species present <sup>6</sup>	Stiver et al. 2015 <sup>13</sup>
	Riparian and/or meadow habitat condition	Proper Functioning Condition	Stiver et al. 2015 <sup>13</sup>
<b>WINTER1 November-March1 (Apply to areas of known or likely winter-use)</b>			
Cover and Food	Seasonal habitat extent (Percent of Seasonal Habitat Meeting Desired Condition)	>80% of the wintering habitat meets winter habitat characteristics where appropriate (relative to ecological site, etc.).	Connelly et al. 2000 <sup>8</sup>
	Sagebrush cover and height above snow	Sagebrush is at least 10 inches (25 cm) above snow and ≥10% cover <sup>16</sup>	Connelly et al. 2000 <sup>8</sup> Stiver et al. 2015 <sup>13</sup>

## Notes and references:

1. Seasonal dates can be adjusted by local unit according to geographic region.
2. Since plant species and/or life forms may overlap, total vegetative cover, inclusive of shrubs, forbs and grasses may exceed 100%.
3. Arid corresponds to the 10 – 12 inch precipitation zone; *Artemisia tridentata wyomingensis* is a common big sagebrush sub- species for this type site (Stiver et al. 2015).
4. Mesic corresponds to the ≥12 inch precipitation zone; *Artemisia tridentata vaseyana* is a common big sagebrush sub-species for this type site (Stiver et al. 2015).
5. Collectively the indicators for sagebrush (cover, height, and shape), perennial grass and perennial forb (cover, height and/or availability) represent the desired condition range for nesting/early brood rearing habitat characteristics, consistent with the breeding habitat suitability matrix identified in Stiver et al. 2015. Sagebrush plants that are more tree or columnar-shaped provide less protective cover near the ground than sagebrush plants with a spreading shape (Stiver et al. 2015). Some sagebrush plants are naturally columnar

(e.g., Great Basin big sagebrush), and a natural part of the plant community. However, a predominance of columnar shape arising from animal impacts may warrant management investigation or adjustments at site specific scales.

6. Preferred forbs are listed in Stiver et al. 2015. Overall total forb cover may be greater than that of preferred forb cover since not all forb species are listed as preferred.
7. Baruch-Mordo, S., J. S. Evans, J. P. Severson, D. E. Naugle, J. D. Maestas, J. M. Kiesecker, M. J. Falkowski, C. A. Hagen, and K. P. Reese. 2013. Saving sage-grouse from trees. *Biological Conservation* 167:233-241.
8. Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to manage sage-grouse populations and their habitats. *Wildlife Society Bulletin* 28:967-985.
9. Connelly, J. W., K. P. Reese, and M. A. Schroeder. 2003. Monitoring of Greater sage-grouse habitats and populations. University of Idaho College of Natural Resources Experiment Station Bulletin 80. University of Idaho, Moscow, Idaho.
10. Doherty, K. 2008. Sage-grouse and Energy Development: Integrating Science with Conservation Planning to Reduce Impacts. Ph.D. Dissertation. University of Montana, Missoula, Montana.
11. Hagen, C. A., J. W. Connelly, and M. A. Schroeder. 2007. A meta-analysis of greater sage-grouse *Centrocercus urophasianus* nesting and brood-rearing habitats. *Wildlife Biology* 13 (Supplement 1):42-50.
12. Holloran, M. J., and S. H. Anderson. 2005. Spatial Distribution of Greater Sage-grouse nests in relatively contiguous sagebrush habitats. *Condor* 107:742-752.
13. Stiver, S. J., E. T. Rinkes, D. E. Naugle, P. D. Makela, D. A. Nance, and J. W. Karl. 2015. Sage-Grouse Habitat Assessment Framework: A Multi-scale Habitat Assessment Tool. Bureau of Land Management and Western Association of Fish and Wildlife Agencies Technical Reference 6710-1. U.S. Bureau of Land Management, Denver, Colorado.
14. Connelly, J.W., A. Moser, and D. Kemner. 2013. Greater Sage-Grouse breeding habitats: Landscape-based comparisons. *Grouse News* 45. Research Reports.
15. Some late brood habitat occurs at higher elevations outside of mapped nesting habitat and some is embedded within nesting landscapes especially areas such as wet meadows, riparian areas, springs and seeps.
16. Winter habitat metrics are a guideline but snow depths and habitat availability may vary widely depending on winter severity, topography and elevation.

#### Greater Sage-Grouse Management Areas

Objective SSS 3: Maintain a resilient population of GRSG in Idaho and Southwestern Montana.

Objective SSS 4: Designate GRSG management areas and associated management to maintain a resilient population and to designate strategically located adjacent areas to provide a buffer from unpredictable habitat loss such as wildfire to the resilient population areas.



Objective SSS 5: Identify and strategically protect larger intact sagebrush areas and areas of lower fragmentation to maintain GRSG population persistence.

### *Management Decisions (MD)*

MD SSS-1: Designate five GRSG Conservation Areas (see Glossary) within the subregion to form the geographic basis for achieving population objectives; evaluating the disturbance density and adaptive regulatory triggers; and tailor adaptive management responses. These conservation areas are depicted in Figure 2-13. These areas are referred to as Mountain Valleys, Desert, West Owyhee, Southern and Southwestern Montana Conservation Areas.

#### *Conservation Area Description*

Mountain Valleys Conservation Area – generally located north of the Snake River Plain, including GRSG habitat in the Salmon and Challis areas, and habitat in west-central population area. It extends west from Rexburg, north and west of Highway 33 to Howe, north and west of Highway 33/22 to Arco, north and west of Highway 26/20/93 to Carey, north and west of Highway 20 west to Hill City, north and west of Highway 20 to the Dylan Karaus Road, west to Canyon Creek. Canyon Creek to the confluence with the Snake River form the western boundary.

Desert Conservation Area – located north of the Snake River and south of the Mountain Valleys Conservation Area. It extends from the confluence of Canyon Creek and the Snake River, eastward to Idaho Falls. The Snake River and Henry's Fork form the eastern boundary.

West Owyhee Conservation Area – located south of the Snake River and west of the Bruneau River.

Southern Conservation Area – located south of the Snake River and east of the Bruneau River, including East Idaho uplands and Bear Lake Plateau, and the Utah portion of the Sawtooth National Forest in Box Elder County.

Southwestern Montana – located in southwestern Montana - encompassing the Dillon Butte BLM Field Office and Beaverhead-Deerlodge National Forest boundaries (the Butte RMP is not being amended and since there are limited GRSG federal GHMA, management actions do not apply in the Butte Field Office).

In general, GRSG habitats in the Desert and West Owyhee CAs are relatively contiguous, while those in the Mountain Valleys and Southern CAs tend to be more fragmented due to more complex topography, and elevational differences and/or effects from wildfires, agriculture, urbanization or other factors.

MD SSS 2: Within each Conservation Area designate GRSG Habitat Management Areas: Priority, Important and General Habitat Management Areas (Figure 2-1). Priority Habitat Management Areas (PHMA) focus on conserving the two key meta-populations in the subregion. PHMA encompasses areas with the highest conservation value to GRSG, based on the presence of larger leks, habitat extent, important movement and connectivity corridors and winter habitat. PHMA include adequate area to accommodate continuation of existing land uses and landowner activities. Important Habitat Management Areas (IHMA) contain additional habitat and populations that provide a management buffer for the PHMA and to connect patches of PHMA. IHMA encompasses areas of generally moderate to high conservation value habitat and/or populations and in some Conservation Areas includes areas beyond those identified by USFWS as necessary to maintain redundant, representative and resilient populations (Priority

Areas for Conservation (PACs)). IHMA are typically adjacent to PHMA but generally reflect somewhat lower GRSG population status and/or reduced habitat value due to disturbance, habitat fragmentation or other factors. There are no IHMA designated within the Southwestern Montana Conservation Area. General Habitat Management Areas (GHMA) encompass habitat that is outside of PHMA or IHMA. GHMA contain approximately 10 percent of the occupied leks that are also of relatively low male attendance compared to leks in PHMA or IHMA. GHMA are generally characterized by lower quality disturbed or patchy habitat of low lek connectivity.

MD SSS 3: In Idaho, designate PHMA and IHMA to encompass 90 percent of the breeding males in Idaho. In Montana, designate PHMA to encompass Montana Fish, Wildlife, and Parks 2009 Greater Sage Grouse Core Area designations.

MD SSS 4: Annually prioritize Conservation Areas at the state scale considering results of the annual adaptive regulatory trigger evaluations relative to implementation of restoration and mitigation activities.

MD SSS 5: Prioritize activities and mitigation to conserve, enhance and restore GRSG habitats (i.e., fire suppression activities, fuels management activities, vegetation treatments, invasive species treatments etc.) first by Conservation Area, if appropriate (Conservation Area under adaptive management or at risk of meeting an adaptive management soft or hard trigger), followed by PHMA, then IHMA then GHMA within the Conservation Areas. Local priority areas within these areas will be further refined as a result of completing the GRSG Wildfire and Invasive Species Habitat Assessments as described in Appendix H. This can include projects outside GRSG habitat when those projects will provide a benefit to GRSG habitat.

MD SSS 6: The management area map and Biologically Significant Unit (BSU) baseline map will be re-evaluated in conjunction with plan evaluation processes (i.e. approximately every 5 years). This re-evaluation can indicate the need to adjust PHMA, IHMA or GHMA or the habitat baseline. These adjustments can occur upon completion of the appropriate analysis and process (e.g., plan amendment) to review the allocation decisions based on the map. Results from the Wildfire and Invasive Species Assessments, such as identified focal or emphasis areas will also be used to help inform mapping adjustments during this evaluation.

MD SSS 7: GRSG habitat within the project area will be assessed during project-level NEPA analysis within the management area designations (PHMA, IHMA, GHMA). Project proposals and their effects will be evaluated based on the habitat and values affected.

MD SSS 8: Idaho BLM will annually update the Key Habitat map, in order to reflect habitat changes resulting from wildfire, succession, and vegetation treatments that occurred or were observed since the last update. Key habitat includes areas of generally intact sagebrush that provide sage-grouse habitat during some portion of the year. This map also identifies potential restoration areas (perennial grassland annual grasslands, conifer encroachment and recent burns). This map a broad scale current vegetation map that changes as habitat is lost or restored. The Key Habitat Map is not an allocation decision such as PHMA, IHMA, and GHMA. Updates to the map will also occur if it is determined that mapping errors or omissions have occurred, or that radio-telemetry studies indicate that GRSG are consistently utilizing an area. Updates are also intended to capture recommendations by the field offices, GRSG Local Working Groups, or agency partners in GRSG conservation. Project-level evaluations of GRSG habitat during the NEPA process can also be used to inform the annual update.

MD SSS 9: Areas of habitat outside of delineated habitat management areas identified during the Key habitat update process will be evaluated during site specific NEPA for project level activities and GRSG required design features (Appendix C) and buffers (Appendix B) will be included as part of project design. These areas will be further evaluated during plan evaluation and the 5-year update to the management areas, to determine whether they should be included as PHMA, IHMA, or GHMA.

MD SSS 10: Designate Sagebrush Focal Areas (SFA) as shown on Figure 1-2. SFA will be managed as PHMA, with the following additional management:

- Recommended for withdrawal from the General Mining Act of 1872, as amended, subject to valid existing rights.
- Managed as NSO, without waiver, exception, or modification, for fluid mineral leasing.
- Prioritized for vegetation management and conservation actions in these areas, including, but not limited to land health assessments, wild horse and burro management actions, review of livestock grazing permits/leases, and habitat restoration (see specific management sections).

#### Adaptive Management

MD SSS 11: Idaho: Use hard and soft population and habitat triggers to determine an appropriate management response as described in MD SSS 16 to MD SSS 26. Hard and soft triggers responses are applied at the Conservation Area (MD SSS-1) scale (Appendix E).

MD SSS 12: Utilize monitoring information collected through the Monitoring Framework (Appendix D) to determine when adaptive regulatory triggers have been met.

MD SSS 13: Idaho: BLM will maintain GRSG habitat information, through use of the Key Habitat map or latest sagebrush/vegetation map, which will be used to track and identify habitat changes to assess the habitat trigger in the adaptive management approach. Key habitat map updates are made each winter by BLM in coordination with the Forest Service and IDFG, using the process described in Appendix F of the FEIS.

MD SSS 14: Idaho: BLM will coordinate with the IDFG regarding population information collected and maintained by the IDFG to track and identify population changes to assess the population trigger in the adaptive management approach.

MD SSS 15: Idaho: The hard and soft trigger data will be analyzed as soon as it becomes available after the signing of the ROD, and twice each year thereafter the applicable monitoring information will be reviewed to determine if any adaptive management triggers have been met. Montana: The hard and soft trigger data will be analyzed as soon as it becomes available after the signing of the ROD and then at a minimum, analyzed annually thereafter.

MD SSS 16: Idaho: Adaptive habitat triggers will be individually calculated across all ownerships within the BSUs (Appendix E). The BSU is defined as the IDFG modeled nesting and wintering habitat (IDFG 2013, unpublished data) within PHMA and IHMA within a Conservation Area. The sagebrush component of the BSU is represented by the Key habitat within the BSU present during the 2011 baseline and as mapped during subsequent annual Key habitat map updates. Key habitat is defined as areas of generally intact sagebrush that provide GRSG habitat during some portion of the year (ISAC 2006).

MD SSS 17: Habitat Hard Triggers are defined as:

- A 20 percent loss of Key Habitat within the BSU of the PHMA of a Conservation Area when compared to the 2011 baseline, inclusive of all land ownerships or
- A 20 percent loss of Key Habitat within the BSU of the IHMA of a Conservation Area when compared to the 2011 baseline.

MD SSS 18: Habitat Soft Triggers are defined as:

- A 10 percent loss of Key Habitat within the BSU of the PHMA of a Conservation Area when compared to the 2011 baseline; or
- A 10 percent loss of Key Habitat within the BSU of the IHMA of a Conservation Area when compared to the 2011 baseline.

MD SSS 19: Population Hard Triggers are defined as:

- A 20 percent decline in the current 3-year average of total maximum number of males counted compared to the 2011 maximum male baseline and a finite rate of change ( $\lambda$ ) significantly below 1.0 within PHMA within a Conservation Area over the same 3-year period; or
- A 20 percent decline in the current 3-year average of total maximum number of males counted compared to the 2011 maximum male baseline and a finite rate of change ( $\lambda$ ) significantly below 1.0 within IHMA within a Conservation Area over the same 3-year period.
- Significance is defined by the 90 percent confidence interval around the current 3-year finite rate of change. If the 90 percent confidence interval is less than, and does not include 1.0, then the finite rate of change is considered significant. The finite rate of change and variance will be calculated following Garton et al. (2011).

MD SSS 20: Population Soft Triggers are defined as:

- A 10 percent decline in the current 3-year average of total maximum number of males counted compared to the 2011 maximum male baseline and a finite rate of change ( $\lambda$ ) significantly below 1.0 within PHMA within a Conservation Area over the same 3-year period; or
- A 10 percent decline in the current 3-year average of total maximum number of males counted compared to the 2011 maximum male baseline and a finite rate of change ( $\lambda$ ) significantly below 1.0 within IHMA within a Conservation Area over the same 3-year period.

MD SSS 21: When any of the Criteria for Soft Triggers have been met the Implementation Team will evaluate causal factors and recommend additional potential implementation level activities (Appendix E).

MD SSS 22: When any of the Criteria for Hard Triggers have been met then all PHMA management actions will be applied to the IHMA within that Conservation Area and the Implementation Team will evaluate causal factors and recommend additional potential implementation level activities.

MD SSS 23: If an adaptive regulatory trigger is tripped and livestock grazing is identified as a probable limiting factor then adjustments will follow the Adaptive Grazing Management Response described in Appendix E.

MD SSS 24: Remove any adaptive management response when the habitat or maximum male population count (i.e., 3-year average) returns to or exceeds the 2011 baseline levels within the associated Conservation Area in accordance with the Adaptive Management Strategy (Appendix E). In such a case, changes in management allocations resulting from a tripped trigger will revert back to the original allocation (MD SSS 22).

MD SSS 25: Montana: Follow the NPT Adaptive Management Guidance and Sideboards. When a hard trigger is hit in a BSU, the designated response will be put in place in that BSU. Triggers and responses have been developed with local state and USFWS experts (Appendix E).

MD SSS 26: Idaho and Montana: When a hard trigger is hit in a BSU within a PAC that has multiple BSUs, including those that cross state lines, the WAFWA Management Zone Greater Sage-Grouse Conservation Team will convene to determine the causal factor, put project-level responses in place, as appropriate and discuss further appropriate actions to be applied. The team will also investigate the status of the hard triggers in other BSUs within the PAC and will invoke the appropriate plan response.

#### Anthropogenic Disturbance

MD SSS 27: For Idaho and Montana, if the 3 percent anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG PHMA (or IHMA in Idaho) Habitat Management Areas in any given BSU, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the General Mining Law of 1872, as amended, valid existing rights, etc.) will be permitted by BLM within GRSG PHMA and IHMA in any given BSU until the disturbance has been reduced to less than the cap, as measured according to the Disturbance and Adaptive Management Appendix (Appendix E) for the intermediate scale.

For Idaho, if the 3 percent disturbance cap is exceeded on all lands (regardless of land ownership) within a proposed project analysis area (Appendix E) in a PHMA (or IHMA in Idaho), then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the General Mining Law of 1872, as amended, valid existing rights, etc.).

For Montana, if the 3 percent disturbance cap is exceeded on lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5% within a project analysis area in PHMA, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) will be permitted by BLM within PHMA in a project analysis area until the disturbance has been reduced to less than the cap. If the BLM determines that the State of Montana has adopted a GRSG Habitat Conservation Program that contains comparable components to those found in the State of Wyoming's Core Area Strategy including an all lands approach for calculating anthropogenic disturbances, a clear methodology for measuring the density of operations, and a fully operational Density Disturbance Calculation Tool, the 3% disturbance cap will be converted to a 5% cap for all sources of habitat alteration within a project analysis area.

In both Idaho and Montana, within existing designated utility corridors, the 3% disturbance cap may be exceeded at the project scale if the site specific NEPA analysis indicates that a net conservation gain to the species will be achieved. This exception is limited to projects which fulfill the use for which the corridors were designated (ex., transmission lines, pipelines) and the designated width of a corridor will not be exceeded as a result of any project co-location.

For Idaho the BSU (Figure 2-2) is defined as the currently mapped nesting and wintering habitat within PHMA and IHMA within a Conservation Area, inclusive of all ownerships. For Montana the BSU is defined as the PHMA in Montana. Anthropogenic disturbance excludes habitat disturbance from wildfire and fuels management activities and includes the following developments (see Appendix E for further details):

- Oil and Gas Wells and Development Facilities
- Coal Mines
- Wind Towers
- Solar Fields
- Geothermal Development Facilities
- Mining (Active Locatable, Non-Energy Leasable and Saleable Developments)
- Roads
- Railroads
- Power lines
- Communication Towers
- Other Vertical Structures
- Coal bed Methane Ponds
- Meteorological Towers (e.g., wind energy testing)
- Nuclear Energy Facilities
- Airport Facilities and Infrastructure
- Military Range Facilities and Infrastructure
- Hydroelectric Plants
- Recreation Areas Facilities and infrastructure

For Idaho this disturbance is measured by direct footprint or by ROW width for linear features (power lines, pipelines and roads). For Montana disturbance is measured similar to the Wyoming Disturbance Density Calculation Tool process described in Appendix E.

Subject to applicable laws and regulations and valid existing rights, if the average density of one energy and mining facility per 640 acres (the density cap) is exceeded on all lands (regardless of land ownership) in the Priority Habitat Management Area within a proposed project analysis area, then no further disturbance from energy or mining facilities will be permitted by BLM: (1) until disturbance in the proposed project analysis area has been reduced to maintain the limit under the cap; or (2) unless the energy or mining facility is co-located into an existing disturbed area.

MD SSS 28: New anthropogenic disturbances within PHMA or IHMA within a Conservation Area where the disturbance cap is already exceeded from any source or where the proposed

development will result in the cap being exceeded will not be allowed in within that Conservation Area until enough habitat has been restored within that Conservation Area to maintain the area under this cap (subject to valid existing rights).

MD SSS 29: New anthropogenic disturbances within PHMA (Idaho only): Anthropogenic Disturbance Screening Criteria. In order to avoid surface-disturbing activities in PHMA, priority will be given to development (including ROWs, fluid minerals and other mineral resources subject to applicable stipulations) outside of PHMA. When authorizing development in PHMA, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG. In addition to the PHMA and IHMA Anthropogenic Disturbance Development Criteria (MD SSS 30), the following criteria must all be met in the project screening and assessment process:

1. The population trend for the GRSG within the associated Conservation Area is stable or increasing over a three-year period and the population levels are not currently engaging the adaptive management triggers (this applies strictly to new authorizations; renewals and amendments of existing authorizations will not be subject to this criteria when it can be shown that long-term impacts from those renewals or amendments will be substantially the same as the existing development);
2. The development with associated mitigation will not result in a net loss of GRSG Key habitat and mitigation will provide a net conservation benefit to the respective PHMA;
3. The project and associated impacts will not result in a net loss of GRSG Key habitat or habitat fragmentation or other impacts causing a decline in the population of the species within the relevant Conservation Area (the project will be outside Key habitat in areas not meeting desired habitat conditions or the project will provide a benefit to habitat areas that are functioning in a limited way as habitat);
4. The development cannot be reasonably accomplished outside of the PHMA; or can be either: 9) developed pursuant to a valid existing authorization; or 2) is co-located within the footprint of existing infrastructure (proposed actions will not increase the 2011 authorized footprint and associated impacts more than 50 percent, depending on industry practice).
5. Development will be implemented adhering to the required design features (RDF) described in Appendix C;
6. The project will not exceed the disturbance cap (MD SSS 27)
7. The project has been reviewed by the State Implementation Team and recommended for consideration by the Idaho Governor.

MD SSS 30: The following Anthropogenic Disturbance Development Criteria must be met in the screening and assessment process for proposals in PHMA and IHMA to discourage additional disturbance in PHMA and IHMA (as described in MD LR 2 and MD RE 1; applies to Idaho only):

1. Through coordination with the USFWS and State of Idaho (as described in MD CC 1), it is determined that the project cannot be achieved, technically or economically, outside of this management area; and

2. The project siting and/or design should best reduce cumulative impacts and/or impacts on GRSG and other high value natural, cultural, or societal resources; this may include co-location within the footprint for existing infrastructure, to the extent practicable; and
3. The project results in a net conservation gain to GRSG Key habitat or with beneficial mitigation actions reduces habitat fragmentation or other threats within the Conservation Area; and
4. The project design mitigates unavoidable impacts through appropriate compensatory mitigation; and
5. Development will be implemented adhering to the RDFs described in Appendix C.
6. The project will not exceed the disturbance cap (MD SSS 27).

In Montana, the BLM will apply the project/action screen and mitigation process (Appendix J).

MD SSS 31: Co-locating new infrastructure within existing ROWs and maintaining and upgrading ROWs is preferred over the creation of new ROWs or the construction of new facilities in all management area. Co-location for various activities is defined as:

- Communication Sites – The installation of new equipment/facilities on or within or adjacent to existing authorized equipment/facilities or within a communication site boundary as designated in the Communication Site Plan.
- Electrical Lines – Installation of new ROWs adjacent to current ROWs boundaries, not necessarily placed on the same power poles.
- Other Rights-of-Way – The installation of new ROWs within the existing footprint of an approved ROW boundary or adjacent to an approved ROW boundary.
- Designated Corridors – The installation of new rights-of-way within the existing corridor or adjacent to the existing corridor.

MD SSS 32: Incorporate RDFs as described in Appendix C in the development of project or proposal implementation, reauthorizations or new authorizations and suppression activities, as conditions of approval (COAs) into any post-lease activities and as best management practices for locatable minerals activities, to the extent allowable by law, unless at least one of the following conditions can be demonstrated and documented in the NEPA analysis associated with the specific project:

1. A specific RDF is not applicable to the site-specific conditions of the project or activity;
2. A proposed design feature or BMP is determined to provide equal or better protection for GRSG or its habitat; or
3. Analysis concludes that following a specific RDF will provide no more protection to GRSG or its habitat than not following it, for the project being proposed.

MD SSS 33: Conduct implementation and project activities, including construction and short-term anthropogenic disturbances consistent with seasonal habitat restrictions described in Appendix C.



MD SSS 33: Conduct implementation and project activities, including construction and short-term anthropogenic disturbances consistent with seasonal habitat restrictions described in Appendix C.

MD SSS 34: RDFs and seasonal habitat restrictions will not be required for emergency or short-term activities necessary to protect and preserve human life or property.

MD SSS 35: In undertaking BLM management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer-distances identified in the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review (Open File Report 2014-1239) in accordance with Appendix B.

MD SSS 36: Incorporate appropriate conservation measures for slickspot peppergrass (*Lepidium papilliferum*) as described in the 2014 Conservation Agreement (as updated, amended or reauthorized) into implementation and project design within slickspot peppergrass habitat in the Jarbidge and Four Rivers Field Offices to avoid and minimize impacts on slickspot peppergrass.

#### Monitoring

MD SSS 37: Once FIAT Assessments are complete, annually complete a review of FIAT Assessment implementation efforts within GRSG habitat with appropriate USFWS and state agency personnel.

MD SSS 38: Monitor the effectiveness of projects (e.g., fuel breaks, fuels treatments) until objectives have been met or until it is determined that objectives cannot be met, according to the monitoring schedule identified for project implementation.

MD SSS 39: Monitor invasive vegetation post vegetation management treatment.

MD SSS 40: Monitor project construction areas for noxious weed and invasive species for at least 3 years, unless control is achieved earlier.

MD SSS 41: Use lek, nesting and winter habitat maps and key habitat map (updates) to annually assess GRSG population and habitat status in the context of the adaptive management triggers.

MD SSS 42: Continue to support updates to the Key Habitat map to track vegetation changes in relation to GRSG habitat on a yearly basis, until such a time this process is replaced. The process used to update the Key Habitat Map is described in Appendix F of the FEIS.

MD SSS 43: Monitor GRSG habitat as described in the monitoring framework plan (Appendix D) in coordination with IDFG and Montana FWP.

#### 2.2.2 Vegetation (VEG)

Objective VEG 1: Reconnect and expand areas of higher native plant community integrity/rangeland health to increase the extent of high quality habitat and, where possible, to accommodate the future effects of climate change.

Objective VEG 2: Increase the amount and functionality of seasonal habitats by:

- Increasing or enhancing canopy cover and average patch size of sagebrush.
- Increasing the amount, condition, and connectivity of seasonal habitats.
- Protecting or improving GRSG migration/movement corridors.

- Reducing conifer encroachment within GRSG seasonal habitats.
- Improving understory (grass, forb) and/or riparian condition within breeding and late brood-rearing habitats.
- Reducing the extent of annual grasslands within and adjacent to PHMA and IHMA.

Decadal treatment objectives by population area are identified in Table 2–3 Estimated Acres of Treatment Needed within a 10–Year Period to Achieve Vegetation Objectives on BLM-Administered Lands.

Objective VEG 3: In all SFA and PHMA, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions. The attributes necessary to sustain these habitats are described in Interpreting Indicators of Rangeland Health (BLM Tech Ref 1734-6).

### Management Decisions (MD)

#### Sagebrush Steppe

MD VEG 1: Implement habitat rehabilitation or restoration projects in areas that have potential to improve GRSG habitat using a full array of treatment activities as appropriate, including chemical, mechanical and seeding treatments.

Table 2–3 Estimated Acres of Treatment Needed within a 10–Year Period to Achieve Vegetation Objectives of BLM-Administered Lands.

<b>Population Area</b>	<b>Mechanical<sup>2</sup></b>	<b>Prescribed Fire (MD FIRE 31) <sup>3</sup></b>	<b>Grass Restoration (MD VEG 2) <sup>4</sup></b>
Bear Lake Plateau	1,000	0	0
East Idaho Uplands	6,000	9,000	1,000
S Central Idaho/N Snake River and Mountain Valleys	18,000	11,000	162,000
Weiser	0	0	13,000
SW Idaho	52,000	10,000	444,000
SW Montana	0	0	0

#### Notes:

1. These are estimates of treatments required to achieve and/or maintain desired habitat conditions over a period of ten years. There are many dynamic and highly variable disturbances that may happen over that period of time that can have a significant effect on the amount, type, and timing of treatment needed. Those disturbances are factored into the ten-year simulation using stochastic, not predictive, techniques. Probabilities of events such as large wildfires are used in the model to make the simulation as realistic as possible, given empirical data about such events in the past, but the results of the simulation cannot be used to predict the future occurrence of such events, including their timing, size, or location, which are essentially random.
2. Removal of conifers that have invaded sagebrush including phase one juniper that is 10 percent or less and reducing sagebrush cover in areas over 30 percent canopy cover

3. Acres are those that are greater than 30 percent sagebrush canopy cover and/or invaded by 10 percent or greater conifer.
4. Acres presently dominated by annual grasses that can be improved by herbicide application and seeding of perennial vegetation.

MD VEG 2: Implement vegetation rehabilitation or manipulation projects to enhance sagebrush cover or to promote diverse and healthy grass and forb understory to achieve the greatest improvement in GRSG habitat based on FIAT Assessments, HAF assessments, other vegetative assessment data and local, site specific factors that indicate sagebrush canopy cover or herbaceous conditions do not meet habitat management objectives (i.e. is minimal or exceeds optimal characteristics). This may necessitate the use of prescribed fire as a site preparation technique to remove annual grass residual growth prior to the use of herbicides in the restoration of certain lower elevation sites (e.g., Wyoming big sagebrush) but such efforts will be carefully planned and coordinated to minimize impacts on GRSG seasonal habitats.

MD VEG 3: Require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success (Richards et al. 1998). Non-native seeds may be used as long as they support GRSG habitat objectives (Pyke 2011) to increase probability of success, when adapted seed availability is low or to compete with invasive species especially on harsher sites.

MD VEG 4: Implement management changes in restoration and rehabilitation areas, as necessary, to maintain suitable GRSG habitat, improve unsuitable GRSG habitat and to ensure long-term persistence of improved GRSG habitat (Eiswerth and Shonkwiler 2006). Management changes can be considered during livestock grazing permit renewals, travel management planning, and renewal or reauthorization of ROWs.

MD VEG 5: Consider establishing seed harvest areas that are managed for seed production (Armstrong 2007) to provide a reliable source of locally adapted seed to use during rehabilitation and restoration activities.

MD VEG 6: Allocate use of native seed to GRSG or ESA listed species habitat in years when preferred native seed is in short supply. This may require reallocation of native seed from ESR projects outside of PHMA or IHMA to those inside it. Where probability of success or native seed availability is low, nonnative seeds may be used as long as they meet GRSG habitat conservation objectives (Pyke 2011). Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, shall be the highest priority for rehabilitation efforts.

MD VEG 7: During land health assessments, evaluate the relative value of existing nonnative seeding within GRSG habitat as: 1) a component of a grazing system allowing improvement of adjacent native vegetation, 2) development of a forage reserve, 3) incorporation into a fuel break system (Davies et al. 2011) or 4) restoration/diversification for GRSG habitat improvement. Where appropriate and feasible, diversify seedings, or restore to native vegetation when potential benefits to GRSG habitat outweigh the other potential uses of the non-native seeding, with emphasis on PHMA and IHMA. Allow recolonization of seedings by sagebrush and other native vegetation.

#### Conifer Encroachment

*Appendix C Idaho and Southwestern Montana  
Greater Sage-Grouse Approved Resource  
Management Plan Amendment Attachment 1–  
Chapter 2, and Required Design Features*

MD VEG 8: Remove conifers encroaching into sagebrush habitats, in a manner that considers tribal cultural values. Prioritize treatments closest to occupied GRSG habitats and near occupied leks, and where juniper encroachment is phase 1 or phase 2. Use of site-specific analysis and tools like the FIAT report (Chambers et. al., 2014) will help refine the location for specific areas to be treated.

#### Invasive Species

MD VEG 9: Incorporate results of the FIAT Assessments into projects and activities addressing invasive species as appropriate.

MD VEG 10: Implement noxious weed and invasive species control using integrated vegetation management actions per national guidance and local weed management plans for Cooperative Weed Management Areas in cooperation with State and Federal agencies, affected counties, and adjoining private lands owners.

MD VEG 11: Conduct integrated weed management actions for noxious and invasive weed populations that are impacting or threatening GRSG habitat quality using a variety of eradication and control techniques including chemical, mechanical and other appropriate means.

MD VEG 12: Require project proponent (projects described in MD SSS 27 and which are included in the anthropogenic disturbance cap evaluation) to ensure that noxious weeds and invasive species caused as a result of the project are treated to eliminate establishment on the disturbed project construction areas for at least 3 years and monitored and treated during the life of the project.

MD VEG 13: Treat areas that contain cheatgrass and other invasive or noxious species to minimize competition and favor establishment of desired species.

#### 2.2.3 Fire and Fuels Management (FIRE)

Objective FIRE 1: Design fuel treatments to restore, enhance, or maintain GRSG habitat.

Objective FIRE 2: Manage wildfires to minimize loss of sagebrush and protect GRSG habitat.

#### Management Decisions (MD)

##### Pre-Suppression

MD FIRE 1: (Wildfire Preparedness): Support development and implementation of Rangeland Fire Protection Associations (RFPAs) in coordination with the State of Idaho.

MD FIRE 2: Develop a consistent approach to fire restrictions within GRSG habitat through the existing coordinated inter-agency approach to fire restrictions based upon National Fire Danger Rating System thresholds (fuel conditions, drought conditions, and predicted weather patterns).

MD FIRE 3: Annually incorporate into existing fire management plans results and updates from the Wildfire and Invasive Species Habitat Assessments (FIAT Assessments) described in Appendix H, to communicate/explain the resource value of GRSG habitat, including fire prevention messages and actions to reduce human-caused ignitions.

MD FIRE 4: Continue to participate with the Wildland Fire Leadership Council, a cooperative, interagency organization dedicated to achieving consistent implementation of the goals, actions, and policies in the National Fire Plan and the Federal Wildland Fire Management Policy.

MD FIRE 5: Continue annual coordination meetings held between cooperating agencies that have fire suppression responsibilities. Incorporate Rangeland Fire Protection Associations and other stakeholders into this coordination. Discuss priority suppression areas and distribute maps showing priority suppression areas at both the Conservation Area and the local office levels as based on the adaptive management strategy and FIAT Assessments.

MD FIRE 6: Ensure firefighter personnel receive annual orientation regarding GRSG habitat and sagebrush management issues as related to wildfire suppression.

MD FIRE 7: As part of the FIAT Assessments, identify roads, trails, and recreational use areas with high frequency of human caused fires within or adjacent to the PHMA or IHMA. Consider these areas during annual fire restriction evaluations, and as appropriate, through site specific management.

MD FIRE 8: Coordinate with Federal, State and local jurisdictions on fire and litter prevention programs to reduce human caused ignitions.

MD FIRE 9: Implement activities identified within the FIAT Assessments.

#### Suppression

MD FIRE 10: Complete Wildland Fire and Invasive Species Assessments (FIAT Assessments) as described within Appendix H and incorporate results into appropriate Fire Management Plans as they are completed. FIAT Assessments are interdisciplinary evaluations of the threats posed by wildfire and invasive species, as well as identification of focal and emphasis habitats/treatment opportunities for fuels management, fire management, and restoration. These FIAT Assessments identify focal and emphasis habitats and describe strategies for fuels management, suppression and restoration activities. Focal and Emphasis Habitats identified through the FIAT Assessment to further refine priority areas for treatments to reduce the threats posed by wildfire, invasive annual grass and conifer expansion.

MD FIRE 11: As part of the FIAT Assessments incorporate a wildfire response time analysis focusing on response time to identified priority areas within PHMA and IHMA or on those fires that have the potential to impact PHMA and IHMA. Incorporate findings into Unit Initial Attack program that determines initial attack resources.

MD FIRE 12: As part of the FIAT Assessment incorporate a water capacity analysis for suppression purposes, including potential private water sources. Utilized the analysis to ensure water availability for response to fire in or threatening PHMA and IHMA during initial attack.

MD FIRE 13: During high fire danger conditions, stage initial attack and secure additional resources closer to priority areas identified in the FIAT Assessments, based on anticipated fires and weather conditions, with particular consideration of the West Owyhee, Southern and Desert Conservation Areas to ensure quicker response times in or near GRSG habitat after considerations and placement of resources to protect human life and property.

MD FIRE 14: Utilize a full range of fire management strategies and tactics through strategic wildfire suppression planning consistent with appropriate management response and within

acceptable risk levels, to achieve resource objectives for GRSG habitat consistent with land use plan direction. Utilizing both direct and indirect attack as appropriate to limit the overall amount of GRSG habitat burned. This can include suppressing fires in intact sagebrush habitats; limiting fire growth in GHMA when suppression resources are available or managing wildfire for resource benefit in areas of conifer (juniper) encroachment.

MD FIRE 15: Suppression priorities: The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be done based on the values to be protected, human health and safety, and the costs of protection. Maintaining GRSG habitat will be the highest natural resources priority immediately after human life and property, commensurate with threatened and endangered species habitat or other critical habitats to be protected.

MD FIRE 16: Ensure close coordination with federal and state firefighters including the Rangeland Fire Protection Associations during suppression activities.

#### Fuels Management

MD FIRE 17: Design and implement fuels treatments that will reduce the potential start and spread of unwanted wildfires and provide anchor points or control lines for the containment of wildfires during suppression activities with an emphasis on maintaining, protecting, and expanding sagebrush ecosystems and successfully rehabilitated areas and strategically and effectively reduce wildfire threats in the greatest area.

MD FIRE 18: Enhance (or maintain/retain) sagebrush canopy cover and community structure to match expected potential for the ecological site and consistent with GRSG habitat objectives unless fuels management objectives requires additional reduction in sagebrush cover to meet strategic protection of GRSG habitat. Closely evaluate the benefits of the fuel management treatments against the additional loss of sagebrush cover on the local landscape in the NEPA process.

MD FIRE 19: Apply appropriate seasonal restrictions for implementing vegetation and fuels management treatments according to the type of seasonal habitats present. Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around and/or in the winter range and will protect, maintain, increase, or enhance winter range habitat quality. Ensure chemical applications are utilized where they will assist in success of fuels treatments. Strategically place treatments on a landscape scale to prevent fire from spreading into PHMA or WUI.

MD FIRE 20: Develop a fuels continuity and management strategy to expand, enhance, maintain and protect GRSG habitat informed by the FIAT Assessments completed as described in Appendix H.

MD FIRE 21: When developing the fuels management strategy as part of the FIAT Assessment described in Appendix H consider up-to-date fuels profiles; land use plan direction; current and potential habitat fragmentation; sagebrush and GRSG ecological factors; active vegetation management steps to provide critical breaks in fuel continuity where appropriate; incorporate a comparative risk analysis with regard to the risk of increased habitat fragmentation from a proposed action versus the risk of large scale fragmentation posed by wildfires if the action is not taken.

MD FIRE 22: Fuel treatments will be designed through an interdisciplinary process to expand, enhance, maintain, and protect GRS habitat which considers a full range of cost effective fuel reduction techniques, including: chemical, biological (including grazing and targeted grazing), mechanical and prescribed fire treatments.

MD FIRE 23: Existing and proposed linear ROWs can be considered for use and maintenance as vegetated fuel breaks in appropriate areas (this activity may or may not be part of the ROW permit or the responsibility of the permit holder, in cases where this activity is considered part of mitigation for project design then it will be appropriately included as part of the ROW permit and the responsibility of the permit holder for development and maintenance).

MD FIRE 24: Fuel breaks will incorporate existing vegetation treatments (seedings), rocky areas or other appropriate topography or features or be located adjacent to existing linear disturbance areas where appropriate. Fuel breaks should be placed in areas with the greatest likelihood of compartmentalizing a fire and/or to foster suppression options to protect existing intact habitat.

MD FIRE 25: Strategically pre-treat areas to reduce fine fuels consistent with areas and results identified within the Wildfire and Invasive Species Assessments.

MD FIRE 26: Protect vegetation restoration and rehabilitation efforts/projects from subsequent fire events.

MD FIRE 27: Targeted grazing as a fuels treatment to adjust the vegetation conditions to reduce the potential start and spread of wildfires may be implemented within existing grazing authorizations if feasible such as through temporary non-renewable authorizations, or through contracts, agreements or other appropriate means separate from existing grazing authorizations and permits.

MD FIRE 28: Targeted grazing to achieve fuels management objectives should conform to the following criteria:

- Targeted grazing should be implemented strategically on the landscape, and directly involved the minimum footprint and grazing intensity required to meet fuels management objectives.
- Conform to the applicable Standards for Rangeland Health and Guidelines for Livestock Grazing Management (Idaho or Montana) at the assessment scale (pasture/watershed).
- Where feasible and applicable, coordinate with the grazing permittee to strategically reduce fuels through livestock management within the Mandatory Terms and Conditions of the applicable grazing authorizations.

MD FIRE 29: Prioritize the use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low or non-economical, nonnative seeds may be used to meet GRS habitat objectives to trend toward restoring the fire regime. When reseeding, use fire resistant native and nonnative species, as appropriate, to provide for fuel breaks.

MD FIRE 30: Maintain effectiveness of fuels projects, including fuel breaks, to ensure long-term success, including persistence of seeded species and/or other treatment components while maintaining the integrity of adjacent vegetation.

MD FIRE 31: If prescribed fire is used in GRSG habitat, the NEPA analysis for the Burn Plan will address:

- why alternative techniques were not selected as a viable options;
- how GRSG goals and objectives will be met by its use;
- how the COT Report objectives will be addressed and met;
- a risk assessment to address how potential threats to GRSG habitat will be minimized.

Allow prescribed fire as a vegetation or fuels treatment in Wyoming big sagebrush sites or other xeric sagebrush species sites, or in areas with a potential for post-fire exotic annual dominance only after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Prescribed fire can be used to meet specific fuels objectives that will protect Greater Sage-Grouse habitat in PHMA (e.g., creation of fuel breaks that will disrupt the fuel continuity across the landscape in stands where annual invasive grasses are a minor component in the understory, burning slash piles from conifer reduction treatments, used as a component with other treatment methods to combat annual grasses and restore native plant communities).

Allow prescribed fire in known sage-grouse winter range only after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Any prescribed fire in winter habitat will need to be designed to strategically reduce wildfire risk around and/or in the winter range and designed to protect winter range habitat quality.

#### Post Fire Management

MD FIRE 32: Utilize the findings and Restoration/Rehabilitation Strategy developed as part of the FIAT Assessment process described in Appendix H to determine if GRSG rehabilitation actions are needed, based on ecological potential, and direct emergency stabilization and rehabilitation (ESR) (BLM) actions after fire.

MD FIRE 33: Incorporate GRSG Habitat Management Objectives into ESR/BAER plans based on site potential and in accordance with the Restoration/Rehabilitation Strategy developed as a result of the FIAT Assessments.

MD FIRE 34: Provide adequate rest from livestock grazing to allow natural recovery of existing vegetation and successful establishment of seeded species within burned/ESR areas. All new seedings of grasses and forbs should not be grazed until at least the end of the second growing season, and longer as needed to allow plants to mature and develop robust root systems which will stabilize the site, compete effectively against cheatgrass and other invasive annuals, and remain sustainable under long-term grazing management. Adjust other management activities, as appropriate, to meet ESR objectives.

MD FIRE 35: Adjust, as appropriate, livestock management on adjacent unburned areas to mitigate the effect of the burn on local GRSG populations.

MD FIRE 36: Following seedling establishment, modify grazing management practices if needed to achieve long-term vegetation and habitat objectives.

#### 2.2.4 Livestock Grazing (LG)

#### Management Decisions (MD)



MD LG 1: Maintain existing areas designated as available or unavailable for livestock grazing. Existing active AUMs for livestock grazing within the planning area will not be changed at the broad scale, though the number of AUMs available on an allotment may be adjusted based on site-specific conditions to meet management objectives during term permit renewals, AMP development, or other appropriate implementation planning. Additionally, temporary adjustments can be made annually to livestock numbers, the number of AUMs, and season of use in accordance with applicable regulations.

MD LG 2: Prioritize BLM land health assessments and processing of BLM grazing permits consistent with management area prioritization (MD SSS 4), unless other higher priority considerations exist (MD LG 15) or other factors such as threatened, endangered and proposed species habitat that livestock grazing can affect. Where possible, conduct land health assessments at the watershed, or other meaningful landscape-scale.

MD LG 3: Where opportunities exist, coordinate with other land managers to encourage livestock operations that utilize mixed federal, private and/or state land to be managed at the landscape scale to benefit GRSG and their habitat across land ownerships.

MD LG 4: PHMA & IHMA: During the land health assessment process, identify the type(s) of seasonal habitat the assessed areas are capable of supporting. Utilize the habitat assessment framework, (Stiver et al. 2015) or other BLM approved methodology, in accordance with current policy and guidance to determine whether vegetation structure, condition and composition are meeting GRSG habitat objectives including riparian and lentic areas (Objective SSS 2; Table 2-2). Use appropriate Ecological Site Descriptions, reference sheets and state and transition models to inform desired habitat conditions and expected responses to management changes for the land unit being assessed.

MD LG 5: When modifying grazing management, analyze indirect impacts on habitat, including changes in fuel loading and wildfire behavior.

MD LG 6: When livestock management practices are determined to not be compatible with meeting or making progress towards achievable habitat objectives following appropriate consultation, cooperation and coordination, implement changes in grazing management through grazing authorization modifications, or allotment management plan implementation. Potential modifications include, but are not limited to, changes in:

- Season or timing of use;
- Numbers of livestock;
- Distribution of livestock use;
- Duration and/or level of use;
- Kind of livestock (e.g., cattle, sheep, horses, or goats) (Briske et al. 2011); and
- Grazing schedules (including rest or deferment).

\*Not in Priority Order

MD LG 7: Where opportunities exist, establish forage reserves to facilitate restoration and rehabilitation efforts in GRSG habitat areas. A forage reserve is an area that is set aside for use as

needed by various permittees who might be displaced by wildfire, ESR, restoration efforts, etc. rather than having a term permit issued for grazing like a regular allotment.

MD LG 8: PHMA & IHMA - Where practical, design pasture rotations to utilize non-native perennial grass seedings and/or annual grasslands, during GRSG nesting season annually or periodically.

MD LG 9: Evaluate the locations where salt/supplements are placed, coordinate salt/supplements placement to reduce impacts on GRSG habitat (e.g., existing disturbed areas).

MD LG 10: Incorporate RDFs into Terms and Conditions for crossing permits to limit disturbance of occupied leks when trailing livestock across BLM administered lands in the spring. Work with permittees in locating over-nighting, watering and bedding locations to minimize impacts on seasonal habitats.

MD LG 11: Design any new structural range improvements, following appropriate cooperation, consultation and coordination, to minimize and/or mitigate impacts on GRSG habitat. Any new structural range improvements should be placed along existing disturbance corridors or in unsuitable habitat, to the extent practical, and are subject to RDFs (Appendix C). Structural range improvement in this context, include, but are not limited to: fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments.

MD LG 12: During the land health assessment and grazing permit renewal process, evaluate existing livestock management range improvements with respect to their effect on GRSG habitat. Consider removal of projects that are not needed for effective livestock management, are no longer in working condition, and/or negatively affect GRSG habitat, with the exception of functional projects needed for management of habitat for other threatened, endangered or proposed species or other sensitive resources.

MD LG 13: Prioritize removal, modification or marking of fences or other structures in areas of high collision risk following appropriate cooperation, consultation and coordination to reduce the incidence of GRSG mortality due to fence strikes (Stevens et al. 2012).

MD LG 14: In response to weather conditions (i.e. drought) adjust grazing management (i.e., delay turnout, adjust pasture rotations, adjust the amount and/or duration of grazing) as appropriate to provide for adequate food and cover for GRSG.

MD LG 15: The BLM will prioritize (1) the review of grazing permits/leases, in particular to determine if modification is necessary prior to renewal, and (2) the processing of grazing permits/leases in Sagebrush Focal Areas (SFA) followed by PHMA outside of the SFA. In setting workload priorities, precedence will be given to existing permits/leases in these areas not meeting Land Health Standards, with focus on those containing riparian areas, including wet meadows. Management and conservation action prioritization will occur at the Conservation Area (CA) scale and be based on GRSG population and habitat trends: Focusing management and conservation actions first in SFA followed by areas of PHMA outside SFA. The BLM may use other criteria for prioritization to respond to urgent natural resource concerns (e.g., fire) and legal obligations.

MD LG 16: The NEPA analysis for renewals and modifications of livestock grazing permits/leases that include lands within SFA and PHMA will include specific management thresholds, based on GRSG Habitat Objectives Table, Land Health Standards (43 CFR 4180.2) and ecological site

potential, and one or more defined responses that will allow the authorizing officer to make adjustments to livestock grazing that have already been subjected to NEPA analysis.

MD LG 17: Allotments within SFA, followed by those within PHMA, and focusing on those containing riparian areas, including wet meadows, will be prioritized for field checks to help ensure compliance with the terms and conditions of the grazing permits. Field checks can include monitoring for actual use, utilization, and use supervision. Management and conservation action prioritization will occur at the Conservation Area (CA) scale and be based on GRSG population and habitat trends: Focusing management and conservation actions first in SFA followed by areas of PHMA outside SFA.

MD LG 18: At the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM will consider whether the public lands where that permitted use was authorized should remain available for livestock grazing or be used for other resource management objectives, such as reserve common allotments or fire breaks. This does not apply to or impact grazing preference transfers, which are addressed in 43 CFR 4110.2-3.

## 2.2.5 Wild Horses and Burros (WHB)

### Management Decisions (MD)

WHB-1: Manage herd management areas (HMAs) in GRSG habitat within established AML ranges to achieve and maintain GRSG habitat objectives (Table 2-2).

WHB-2: Complete rangeland health assessments for HMAs containing GRSG habitat using an interdisciplinary team of specialists (e.g. range, wildlife, and riparian). The priorities for conducting assessments are: 1) HMAs Containing SFA; 2) HMAs containing PHMA; 3) HMAs containing IHMA; 4) HMAs containing GHMA; 5) HMAs containing sagebrush habitat outside of PHMA, IHMA, and GHMA mapped habitat; 6) HMAs without GRSG Habitat.

WHB-3: Prioritize gathers and population growth suppression techniques in HMAs in GRSG habitat, unless removals are necessary in other areas to address higher priority environmental issues, including herd health impacts. Place higher priority on Herd Areas not allocated as HMAs and occupied by wild horses and burros in SFA followed by PHMA.

WHB-4: In SFA and PHMA outside of SFA, assess and adjust AMLs through the NEPA process within HMAs when wild horses or burros are identified as a significant causal factor in not meeting land health standards, even if current AML is not being exceeded.

WHB-5: In SFA and PHMA outside of SFA, monitor the effects of wild horse and burro use in relation to GRSG seasonal habitat objectives on an annual basis to help determine future management actions.

WHB-6: Develop or amend herd management area plans (HMAPs) to incorporate GRSG habitat objectives and management considerations for all HMAs within GRSG habitat, with emphasis placed on SFA and other PHMA.

WHB-7: Consider removals or exclusion of wild horse and burros during or immediately following emergency situations (such as fire, floods, and drought) to facilitate meeting GRSG habitat objectives where HMAs overlap with GRSG habitat.

WHB-8: When conducting NEPA analysis for wild horse and burro management activities, water developments, or other rangeland improvements for wild horses, address the direct and indirect impacts on GRSG populations and habitat. Implement any water developments or rangeland improvements using the criteria identified for domestic livestock.

WHB-9: Coordinate with professionals from other federal and state agencies, researchers at universities, and others to utilize and evaluate new management tools (e.g., population growth suppression, inventory techniques, and telemetry) for implementing the wild horse and burro program.

## 2.2.6 Mineral Resources (MR)

### Fluid Minerals

Objective MR 1: Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMA, IHMA, and GHMA. When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in PHMA, IHMA, and GHMA, and subject to applicable stipulations for the conservation of GRSG, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG. The implementation of these priorities will be subject to valid existing rights and any applicable law or regulation, including, but not limited to, 30 USC 226(p) and 43 CFR 3162.3-1(h).

Objective MR 2: Where a proposed fluid mineral development project on an existing lease can adversely affect GRSG populations or habitat, the BLM will work with the lessees, operators, or other project proponents to avoid, minimize and apply compensatory mitigation to the extent compatible with lessees' rights to drill and produce fluid mineral resources. The BLM will work with the lessee, operator, or project proponent in developing an APD or Geothermal Drilling Permit (GDP) for the lease to avoid, minimize, and apply compensatory mitigation to impacts on GRSG or its habitat and will ensure that the best information about the GRSG and its habitat informs and helps to guide development of such Federal leases.

### Management Decisions (MD)

MD MR 1: Idaho and Montana: Areas within SFA will be open to fluid mineral leasing and development and geophysical exploration subject to NSO without waiver, exception, or modification. Areas within PHMA (outside SFA) and IHMA will be open to mineral leasing and development and geophysical exploration subject to NSO with a limited exception (MD MR 3). GHMA will be open to mineral leasing and development and geophysical exploration subject to CSU which includes buffers and standard stipulations.

MD MR 2: In Idaho, parcels nominated for lease in PHMA or IHMA will be evaluated prior to lease offering to determine if development is feasible. In GHMA, parcels will not be offered for lease if buffers and restrictions (including RDFs) preclude development in the leasing area.

MD MR 3: PHMA and IHMA: No waivers or modifications to a fluid mineral lease NSO stipulation will be granted. The Authorized Officer may grant an exception to a fluid mineral lease NSO stipulation only where the proposed action:

- Will not have direct, indirect, or cumulative effects on GRSG or its habitat; or,
- Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to GRSG.

Exceptions based on conservation gain (ii) may only be considered in (a) PHMA of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP amendment. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.

Any exceptions to this lease stipulation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other GRSG expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publicly available at least quarterly.

MD MR 4: Incorporate required design features and best management practices appropriate to the management area as COAs when post leasing activity is proposed into any post-lease authorizations.

MD MR 5: In Montana, prior to leasing conduct a Master Leasing Plan process when all four of the following criteria are met:

- A substantial portion of the area to be analyzed in the MLP is not currently leased.
- There is a majority Federal mineral interest.
- Additional analysis or information is needed to address likely resource or cumulative impacts if oil and gas development were to occur where there are:
  1. multiple-use or natural/cultural resource conflicts;
  2. impacts on air quality;
  3. impacts on the resources or values of any unit of the National Park System, national wildlife refuge, or National Forest wilderness area, as determined after consultation and coordination with the NPS, the USFWS, or the Forest Service; or
  4. impacts on other specially designated areas. — analyzing likely development scenarios and varying mitigation levels.

MD MR 6: In Idaho, complete a Master Development Plan, consistent with plan development guide on leases where a producing field is proposed to be developed.

MD MR 7: Encourage unitization when deemed necessary for proper development and operation of an area (with strong oversight and monitoring). The unitization must be designed in a manner to minimize adverse impacts on GRSG according to the Federal Lease Form, 3100-11, Sections 4 and 6.

MD MR 8: Issue Written Orders of the Authorized Officer (43 CFR 3161.2) requiring reasonable protective measures consistent with the lease terms where necessary to avoid or minimize impacts on GRSG populations or habitat.

#### Locatable Minerals

MD MR 9: Apply reasonable and appropriate RDFs to locatable minerals, to the extent consistent with applicable law to prevent unnecessary or undue degradation of GRSG habitat when a Plan of Operations is submitted for BLM approval, in accordance with 43 CFR 3809.411(d)(2).

MD MR 10: Recommend SFA for withdrawal from the General Mining Act of 1872, as amended, subject to valid existing rights.

#### Salable Minerals

MD MR 11: PHMA: All PHMA will be closed to mineral materials development. However, existing free use permits and the expansion of existing free use permits may be considered only if the following criteria are met:

- the project area disturbance cap is not exceeded within a BSU;
  - the activity is subject to the provisions set forth in the mitigation framework (Appendix F);
  - all applicable required design features are applied; and
  - the activity is permissible under the Idaho exception and development criteria (MD SSS 29 and MD SSS 30)
1. IHMA: All IHMA will be open to mineral materials development, consistent with the Idaho Anthropogenic Disturbance Criteria (MD SSS 30), and subject to RDFs, and buffers. Sales from existing community pits within IHMA will be subject to seasonal timing restrictions (Appendix C).
  2. GHMA: All GHMA will be open to mineral materials development, subject to RDFs and buffers. Sales from existing community pits within GHMA will be subject to seasonal timing restrictions (Appendix C).

MD MR 12: Restore salable mineral pits no longer in use to meet GRSG habitat management objectives.

MD MR 13: Require reclamation bonding that will require restoration of GRSG habitat on new site authorizations for mineral material pits in IHMA (this will not apply to free use permits issued to a government entity such as a county road district, but will apply to non-profit entities).

MD MR 14: Montana: PHMA are closed to new mineral material sales. However, these areas remain “open” to free use permits and the expansion of existing active pits, only if the following criteria are met:

the activity is within the BSU and project area disturbance cap;

the activity is subject to the provisions set forth in the mitigation framework [Appendix F];

all applicable required design features are applied; and

the activity is permissible under the Montana screening criteria (MD SSS 30) Appendix J.

#### Nonenergy Leasable Minerals

MD MR 15: PHMA are closed to leasing. IHMA and GHMA: Areas within Known Phosphate Leasing Areas (KPLAs) will remain open to leasing subject to standard stipulations. IHMA areas outside of KPLAs are open to prospecting and subsequent leasing provided the Anthropogenic Disturbance Development Criteria (MD SSS 30) and the anthropogenic disturbance cap (MD SSS 27) can be met. RDFs and buffers shall be applied to prospecting permits. GHMA: Lands outside KPLAs are available for prospecting and subsequent leasing and initial mine development subject to RDFs, buffers, and standard stipulations.

MD MR 16: Require seasonal and daily timing restrictions (Appendix C) in undeveloped nonenergy mineral leases when exploration activities or initial mine development is proposed (e.g. exploration drilling, timber removal, shrub clearing, etc.) as COAs.

MD MR 17: Include RDFs as COAs to mine plans in undeveloped non-energy mineral leases for exploration activities or initial mine development.

#### Coal (Montana)

MD MR 18: At the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM will determine whether the lease application area is "unsuitable" for all or certain coal mining methods pursuant to 43 CFR 3461.5. PHMA is essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR 3461.5(o)(1).

#### Mineral Split Estate

MD MR 19: BLM Owns Mineral Estate – non-federal surface owner: Where the federal government owns the mineral estate in PHMA, IHMA, and GHMA, and the surface is in non-federal ownership, apply the same stipulations, COAs, and/or conservation measures and RDFs applied if the mineral estate is developed on BLM-administered lands in that management area, to the maximum extent permissible under existing authorities, and in coordination with the landowner.

MD MR 20: BLM owns surface – non-federal mineral estate owner: Where the federal government owns the surface and the mineral estate is in non-federal ownership in PHMA, IHMA, and GHMA, apply appropriate surface use COAs, stipulations, and mineral RDFs through ROW grants or other surface management instruments, to the maximum extent permissible under existing authorities, in coordination with the mineral estate owner/lessee.

### 2.2.7 Renewable Energy (Wind and Solar) (RE)

#### Management Decisions (MD)

#### Industrial Solar, Wind, Nuclear, and Hydropower Development

MD RE 1: PHMA: Designate and manage PHMA as exclusion areas for utility scale (20 MW) wind and solar testing and development, nuclear and hydropower energy development. IHMA: Designate and manage IHMA as avoidance areas for wind and solar testing and development, nuclear and hydropower development. GHMA (Idaho): Designate and manage GHMA as open for wind and solar testing and development and nuclear and hydropower development subject to

RDFs and buffers. GHMA (Montana): Designate and manage GHMA as avoidance for wind and solar testing and development and nuclear and hydropower development.

#### 2.2.8 Lands and Realty (LR)

Objectives LR 1: Effects of infrastructure projects, including siting, will be minimized using the best available science, updated as monitoring information on current infrastructure projects becomes available.

##### Utility Corridors and Communication Sites

MD LR 1: Existing designated corridors, including Section 368 Corridors, will remain Open in all habitat management areas (subject to the ongoing settlement agreement).

Also see MD LR 10 and MD SSS 31

##### Land Use Authorizations

MD LR 2: PHMA: Designate and manage PHMA as ROW avoidance areas, consistent with MD SSS 29 and subject to RDFs and buffers (Appendices B and C). IHMA: Designate and manage IHMA as ROW avoidance areas, consistent with MD SSS 30 and subject to RDFs and buffers. GHMA (Idaho and Montana): Designate and manage GHMA as open with proposals subject to RDFs and buffers.

MD LR 3: PHMA: Development of commercial service airports and facilities (as defined by FAA 2014 – publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service) will not be allowed within PHMA. IHMA and GHMA are Avoidance and Open respectively for these types of ROW applications as described in MD LR 2.

MD LR 4: PHMA: Development of new or expansion of existing landfills will not be allowed within PHMA. IHMA and GHMA are Avoidance and Open respectively for these types of ROW applications as described in MD LR 2.

MD LR 5: Consistent with MD LR 3, MD LR 4, and MD RE 1, Rights-of-way for development of new or amended ROWs and land use authorizations (including permits and leases) in PHMA will only be considered when consistent with the Anthropogenic Disturbance Screening Criteria (MD SSS 29); Rights-of-way for development of new or amended ROWs and land use authorizations (including permits and leases) in IHMA can be considered consistent with the IHMA Anthropogenic Disturbance Development Criteria (MD SSS 30). GHMA: New ROW and land use authorizations can be considered.

MD LR 6: In PHMA, if a higher voltage transmission line is required adjacent to an existing line (i.e. the project is an incremental upgrade/capacity increase of existing development (i.e. power line capacity upgrade):

- the existing transmission line must be removed and area rehabilitated within a specified amount of time after the new line is installed and energized; and
- the new line must be constructed in the same alignment as the existing line unless an alternate route will benefit GRSB or GRSB habitat.

MD LR 7: Process unauthorized use. If the unauthorized use is subsequently authorized, it will be authorized consistent with direction from this plan including RDFs and buffers. If the use is



not subsequently authorized the site will be reclaimed by removing these unauthorized (trespass) features and rehabilitating the habitat.

MD LR 8: Land use authorizations that are temporary (less than 3 years) in nature and are not otherwise excluded or restricted will be subject to seasonal or timing restrictions (Appendix C) and mitigation requirements regarding habitat loss as needed.

MD LR 9: New ROW applications for water facilities (ditches, canals, pipelines), or amendments to existing water facilities which include additional structures to improve fish passage or benefits to fisheries (new diversions, fish screens) will be allowed on a case-by-case basis subject to RDFs to reduce impacts on GRSG habitat and mitigation requirements regarding GRSG habitat loss as needed.

MD LR 10: When a ROW grant expires and is not requested to be renewed, is relinquished, or terminated, the lease holder will be required to reclaim the site by removing overhead lines and other infrastructure and to eliminate avian predator nesting opportunities provided by anthropogenic development on public lands associated with the now void ROW grant (e.g., remove power line and communication facilities no longer in service).

MD LR 11: As opportunities and priorities indicate work with existing ROW holders to retrofit existing towers and structures consistent with RDFs described in Appendix C.

MD LR 12: PHMA (Idaho and Montana) and IHMA (Idaho), and GHMA (Montana only) are designated as avoidance areas for high voltage transmission line and large pipeline ROWs, except for Gateway West and Boardman to Hemingway Transmission Projects. All authorizations in these areas, other than the following identified projects, must comply with the conservation measures outlined in this proposed plan, including the RDFs and avoidance criteria presented in MD SSS 29 and MD SSS 30 of this document. The BLM is currently processing an application for Gateway West and Boardman to Hemingway Transmission Projects and the NEPA review for this project is well underway. Conservation measures for GRSG are being analyzed through the project's NEPA review process, which should achieve a net conservation benefit for the GRSG.

MD LR 13: Consider the likelihood of development of not-yet-constructed surface disturbing activities

– as defined in Table 2 of the Monitoring Framework (Appendix D) – under valid existing rights.

#### Land Tenure

MD LR 14: Lands classified as PHMA, IHMA, and GHMA for GRSG will be retained in federal management unless: (1) the agency can demonstrate that disposal of the lands, including land exchanges, will provide a net conservation gain to the GRSG or (2) the agency can demonstrate that the disposal, including land exchanges, of the lands will have no direct or indirect adverse impact on conservation of the GRSG. Land tenure adjustments will be subject to the following disposal, exchange, and acquisition criteria, which include retaining lands with GRSG habitat. Retention of areas with GRSG will reduce the likelihood of habitat conversion to agriculture, urbanization, or other uses that will remove sagebrush habitat and potentially impact sensitive plants. Criteria:

- Acquire habitat within PHMA and IHMA, when possible (i.e. willing landowner), and retain ownership of habitat within all Areas, except if disposal will allow for additional or more contiguous federal ownership patterns.

- Lands within PHMA, IHMA and GHMA will be retained unless disposal of those lands will increase the extent or provide for connectivity of PHMA, IHMA or GHMA.
- Evaluate potential land exchanges containing historically low-quality GRSG habitat that may be too costly to restore in exchange for lands of higher quality habitat, lands that connect seasonal GRSG habitats or lands providing for threatened and endangered species. These potential exchanges should lead to an increase in the extent or continuity of or provide for
- Identify lands for acquisition that increase the extent of or provide for connectivity of PHMA.

#### Withdrawals

See MD SS 10 regarding Sagebrush Focal Areas (SFA).

#### 2.2.9 Recreation and Visitor Services (REC)

##### Management Decisions (MD)

REC-1: Manage existing recreation uses and sites to minimize adverse effects on GRSG or their habitat through incorporation of RDFs, buffers and seasonal restrictions.

REC-2: In PHMA and IHMA, do not construct new recreation facilities (e.g., campgrounds, trails, trailheads, staging areas) unless the development will have a net conservation gain to GRSG habitat (such as concentrating recreation, diverting use away from critical areas, etc.), or unless the development is required for visitor health and safety or resource protection.

#### 2.2.10 Travel and Transportation (TTM)

##### Management Decisions (MD)

MD TTM 1: Limit off-highway vehicle travel within Idaho BLM Field Offices to existing roads, primitive roads, and trails in areas where travel management planning has not been completed or is in progress. This excludes areas previously designated as open through a land use plan decision or currently under review for designation as open, currently being analyzed in ongoing RMP revision efforts in the Four Rivers, Jarbidge and Upper Snake Field Offices.

MD TTM 2: In PHMA, IHMA, and GHMA, temporary closures will be considered in accordance with 43 CFR subpart 8364 (Closures and Restrictions); 43 CFR subpart 8351 (Designated National Area); 43 CFR subpart 6302 (Use of Wilderness Areas, Prohibited Acts, and Penalties); 43 CFR subpart 8341 (Conditions of Use) and other applicable law and policy.

MD TTM 3: Develop Travel Management Plans for each Field Office as described in the BLM Travel Management Handbook 8342.1 and according to the travel management planning guidelines (Appendix L of FEIS).

MD TTM 4: During subsequent travel management planning design and designate a travel system to minimize adverse effects on GRSG. Locate areas and trails to minimize disturbance of GRSG and/or to have a neutral or positive effect on GRSG habitat and populations. Give special attention to protect endangered or threatened species and their habitats. Allow for route upgrade, closure of existing routes, timing restrictions, seasonal closures, and creation of new routes to help protect habitat and meet user group needs, thereby reducing the potential for pioneering unauthorized routes. The emphasis of the comprehensive travel and transportation planning within PHMA will

be placed on having a neutral or positive effect on GRSG habitat. Individual route designations will occur during subsequent travel management planning efforts.

#### 2.2.11 Mitigation (Montana)

(Also see Appendix F and J)

##### Management Decisions (MD)

Montana 1: BLM will establish an inter-agency State GRSG Conservation Team at the state level (both Idaho and Montana) to help guide conservation of GRSG through compensatory mitigation, within 90 days of the issuance of the Record of Decision.

Montana 2: The BLM, in coordination with the GRSG Conservation Team will develop a Mitigation Strategy within one year of the issuance of the Record of Decision. In Idaho this strategy will be consistent with the Idaho Mitigation Framework (Appendix F).

Montana 3: In all GRSG habitat, in undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation (Appendix E, Table E-1), the BLM will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions.

Montana 4: Mitigate anthropogenic development (Appendix E, Table E-1) impacts on GRSG habitat through application of appropriate mitigation in accordance with the Mitigation Framework (Appendix F and L).

Montana 5: Consistent with regulations for minerals activities, require a full reclamation bond specific to the site when surface disturbing activities are proposed. Ensure reclamation bonds are sufficient to cover costs to fully rehabilitate lost GRSG habitat. Base the reclamation costs on the assumption that contractors for the BLM will perform the work. Areas are considered fully rehabilitated when they meet the conditions described in Table 2-2.

#### 2.2.12 Coordination (CC)

##### Management Decisions (MD)

MD CC 1: Collaborate, coordinate and utilize cooperative planning efforts to implement and monitor activities to achieve desired conditions and to maximize the utilization of available funding opportunities. Coordination efforts can include: adjacent landowners, federal and state agencies, local governments, tribes, communities, other agencies, resource advisory groups, public lands permit holders and non- governmental organizations.

MD CC 2: Develop a cooperative MOU between the BLM, Forest Service and State of Idaho to establish the State of Idaho as a cooperating agency during implementation of the final decision. The MOU will identify responsibilities, role and interaction of the BLM, Forest Service and State of Idaho. Montana BLM will participate as appropriate on Montana's Sage-grouse Oversight Team to facilitate coordination and implementation of BLM's final decision and Montana's Executive Order No. 10-2014.

MD CC 3: The BLM will consider any recommendations from the Governor of Idaho as a result of evaluation completed by the Sage-Grouse Implementation Task Force.

MD CC 4: Idaho: The BLM will coordinate with the State of Idaho and the Idaho Sage-Grouse Implementation Task Force regarding proposed management changes, the implementation of conservation measures, mitigation, and site-specific monitoring, related to adaptive management, anthropogenic disturbance and livestock grazing.

MD CC 5: Montana: The BLM will coordinate with the State of Montana and the Montana Sage-grouse Oversight Team regarding proposed management changes, the implementation of conservation measures, mitigation, and site-specific monitoring, related to adaptive management and anthropogenic disturbance.

MD CC 6: Upon completion of the Record of Decision the BLM will develop an initial Implementation Guide for BLM District and Field Offices within a year of issuance of the Record of Decision. This Guide will define and describe consistent application of the allocations, management actions, required design features, and etc. that are contained within the final plan and will be updated and expanded as needed to respond to issues and concerns.

MD CC 7: At the state level, BLM will coordinate with IDFG, MFWP, USFWS, and other conservation partners in collaborative efforts with adjacent states (Oregon, Nevada, Utah, Montana, Wyoming) in GRSG MZs IV and II to evaluate GRSG habitat and population status and trends and make appropriate regional recommendations for GRSG conservation at broader scales.

MD CC 8: At the state level, BLM will coordinate with the appropriate WAFWA Sage-grouse Technical Committee to develop consistent population and habitat monitoring approaches that facilitate GRSG conservation at the MZ scale.

MD CC 9: All prescribed burning will be coordinated with state and local air quality agencies to ensure that local air quality is not significantly impacted by BLM activities.

#### 2.2.13 RDFs Defined

RDFs are means, measures, or practices intended to reduce or avoid adverse environmental impacts. This LUPA/EIS proposes a suite of design features that will establish the minimum specifications for water developments, certain mineral development, and fire and fuels management and will mitigate adverse impacts. These design features will be required to provide a greater level of regulatory certainty than through implementing BMPs.

In general, the design features are accepted practices that are known to be effective when implemented properly at the project level. However, their applicability and overall effectiveness cannot be fully assessed except at the project-specific level when the project location and design are known. Because of site-specific circumstances, some features may not apply to some projects (e.g., when a resource is not present on a given site) or may require slight variations from what is described in the LUPA/EIS (e.g., a larger or smaller protective area). All variations in design features will require appropriate analysis and disclosure as part of future project authorizations. Additional mitigation measures may be identified and required during individual project development and environmental review. The proposed RDFs are presented in Appendix C.

#### Required Design Features

Required Design Features (RDFs) are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific

circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). RDFs are continuously improving as new science and technology become available and therefore are subject to change. All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF, a state-implemented conservation measure or plan-level protection is determined to provide equal or better protection for GRSG or its habitat.
- A specific RDF will provide no additional protection to GRSG or its habitat.

The following required design features (RDFs) are included for consideration and use based upon review of current science and effects analysis (circa 2014) (Table C-1). These may be reviewed during project evaluation and updated through plan maintenance as new information and updated scientific findings become available.

The table is organized by program area grouping the RDFs most relevant to that program. All relevant RDFs, regardless of which program they are grouped under, should be considered during project evaluation and applicable RDFs should be applied during implementation. The following measures would be applied as RDFs for all solid minerals. They would also apply to locatable minerals consistent with applicable law. In some cases the RDFs may not all be appropriate based on local conditions and would be assessed in the appropriate site specific NEPA analysis, these all should be considered and where determined to be beneficial to achieving GRSG habitat objectives included as part of the site specific project. In other cases additional project design criteria or best management practices could be incorporated into project implementation to address site specific concerns not fully addressed by the RDFs described here.

Table C-1 Required Design Features

<b>Required Design Feature</b>
<b>General</b>
1. Solicit and consider expertise and ideas from local landowners, working groups, and other federal, state, county, and private organizations during development of projects.
2. No repeated or sustained behavioral disturbance (e.g., visual, noise over 10 dbA at lek, etc.) to lekking birds from 6:00 pm to 9:00 am within 2 miles (3.2 km) of leks during the lekking season.
3. Avoid mechanized anthropogenic disturbance, in nesting habitat during the nesting season when implementing: 1) fuels/vegetation/habitat restoration management projects, 2) infrastructure construction or maintenance, 3) geophysical exploration activities; 4) organized motorized recreational events.
4. Avoid mechanized anthropogenic disturbance during the winter, in wintering areas when implementing: 1) fuels/vegetation/habitat restoration management projects, 2) infrastructure construction or maintenance, 3) geophysical exploration activities; 4) organized motorized recreational events.
<b>Wildfire Suppression</b>
5. Compile district-level information into state-wide sage-grouse tool boxes. Tool boxes will contain maps, listing of resource advisors, contact information, local guidance, and other relevant information for each district, which will be aggregated into a state-wide document.

<p>6. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics. The Fire Planning and Fuels Management Division (FA-600) hosts a webpage containing up- to-date maps, instruction memoranda, conservation measures, BMPs, and spatial data specific to fire operations and fuels management/sage-grouse interactions. These resources can be accessed at: <a href="http://web.blm.gov/internal/fire/fpfm/sg/index.html">http://web.blm.gov/internal/fire/fpfm/sg/index.html</a> . Additional BLM sage-grouse information can be found at: <a href="http://www.blm.gov/wo/st/en/prog/more/fish_wildlife_and/sage-grouse-conservation.html">http://www.blm.gov/wo/st/en/prog/more/fish_wildlife_and/sage-grouse-conservation.html</a> .</p>
<p>7. Assign a resource advisor with sage-grouse expertise, or who has access to sage-grouse expertise, to all extended attack fires in or near sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals. Involve state wildlife agency expertise in fire operations through:</p> <ul style="list-style-type: none"> <li>• instructing resource advisors during preseason trainings;</li> <li>• qualification as resource advisors;</li> <li>• coordination with resource advisors during fire incidents;</li> <li>• contributing to incident planning with information such as habitat features or other key data useful in fire decision making</li> </ul>

<p><b>Required Design Feature</b></p>
<p>8. At the onset of an emerging wildland fire the Agency Administrators and Fire Management Officers will engage a local Resource Advisor to assess sage-grouse habitat that may be affected by the fire or suppression activities.</p>
<p>9. If complexity of the wildland fire warrants the activation of an Incident Management Team, locally refined information regarding important sage-grouse habitat will be relayed during in brief and continually throughout the incident.</p>
<p>10. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.</p>
<p>11. As appropriate, utilize existing fuel breaks, such as roads or discrete changes in fuel type, as control lines in order to minimize fire spread.</p>
<p>12. During periods of multiple fires, ensure line officers are involved in setting priorities.</p>
<p>13. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases, etc.) in areas where physical disturbance to sage- grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.</p>
<p>14. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATV) prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.</p>
<p>15. Minimize cross-country vehicle travel during fire operations in sage-grouse habitat.</p>
<p>16. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.</p>
<p>17. Utilize retardant, mechanized equipment, and other available resources to minimize burned acreage during initial attack.</p>
<p>18. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.</p>
<p>19. Adequately document fire operation activities in sage-grouse habitat for potential follow- up coordination activities.</p>
<p><b>Fuels Management</b></p>
<p>Unless otherwise specified as part of the land use plan consider the full array of fuels management treatment types (prescribed fire, mechanical, chemical and biological) when implementing the following RDFs.</p>
<p>20. Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.</p>
<p>21. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.</p>

<b>Required Design Feature</b>
22. Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).
23. Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to NEPA and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
24. Where appropriate, ensure that treatments are configured in a manner that promotes use by sage-grouse.
25. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
26. Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.
27. Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to sage-grouse habitat. Additionally, develop maps for sage-grouse habitat which spatially display existing fuels treatments that can be used to assist suppression activities.
28. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.
29. Emphasize the use of native plant species, especially those from a warmer area of the species' current range, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
30. Remove standing and encroaching trees within at least 110 yards of occupied sage-grouse leks and other habitats (e.g., nesting, wintering and brood rearing) to reduce the availability of perch sites for avian predators, as resources permit.
31. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
32. Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by installing fuel breaks and/or planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
33. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PHMA or priority restoration areas (such as where investments in restoration have already been made).

<b>Required Design Feature</b>
34. Design treatments to provide a break in fuel continuity in large, at-risk, expanses of continuous sagebrush. Use local knowledge of fire occurrence, spread patterns, and habitat values at risk to determine the proper placement and size of the fuel break.
35. Use existing agreements with local, county, and state road departments to improve and maintain existing fuel breaks during routine road maintenance. Examples include: blading, mowing, disking, grading, and spraying roadside vegetation.
36. Form partnerships with linear right-of-way holders to maintain fuel breaks, which reduce fuel continuity and serve to protect at-risk landscapes.
37. Use existing NEPA documentation and authorities, where possible, when conducting road right-of-way maintenance. In many instances, existing authorizations for roads or linear rights-of-way contain provisions for maintenance activities that could be implemented and incorporated into a vegetation and habitat protection strategy without requiring additional NEPA analysis. Document this with a Determination of NEPA Adequacy (DNA).
38. Enter into agreements with road departments which may help fund the construction and maintenance of fuel breaks adjacent to roads, as funding permits.
39. Spatially depict the locations of existing and planned fuel breaks in a landscape fuel break map and label each vegetation polygon for reference. Offices will make these maps available to suppression resources for use in fire operations.
<b>Vegetation Treatment</b>
40. Utilize available plant species based on their adaptation to the site when developing seed mixes. (Lambert 2005; VegSpec).
41. Utilizing the warmer component of a species' current range when selecting native species for restoration when available (Kramer and Havens 2009).
42. Reduce annual grass densities and competition through herbicide, targeted grazing, tillage, prescribed fire, etc. (Pyke 2011).
43. Reduce density and competition of introduced perennial grasses using appropriate techniques to accomplish this reduction (Pellant and Lysne 2005).

44. Utilize techniques to introduce desired species to the site such as drill seeding, broadcast seeding followed by a seed coverage technique, such as harrowing, chaining or livestock trampling, and transplanting container or bare-root seedlings.
45. Assess existing on-site vegetation to ascertain if enough desirable perennial vegetation exists to consider techniques to increase on-site seed production to facilitate an increase in density of desired species.
46. Use site preparation techniques that retain existing desirable vegetation.
47. Use "mother plant" techniques or planting of satellite populations of desirable plants to serve as seed sources.
48. Utilize post-treatment control of annual grass and other invasive species.

<b>Required Design Feature</b>
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49. Utilize new tools and use of new science and research as it becomes available.
50. Give higher priority to vegetation rehabilitation or manipulation projects that include: <ul style="list-style-type: none"> <li>• Sites where environmental variables contribute to improved chances for project success (Meinke et al. 2009).</li> <li>• Areas where seasonal habitat is limiting GRSG distribution and/or abundance (wintering areas, wet meadows and riparian areas, nesting areas, leks, etc.).</li> <li>• Re-establish sagebrush cover in otherwise suitable GRSG with consideration to local needs and conditions using the general priorities in the following order: <ul style="list-style-type: none"> <li>• Recently burned native areas</li> <li>• Native grassland with suitable forb component</li> <li>• Nonnative grassland with suitable forb component</li> <li>• Recently converted annual grass areas</li> <li>• Native grassland</li> <li>• Nonnative grassland</li> </ul> </li> <li>• Where desirable perennial bunchgrasses and/or forbs are deficient in existing sagebrush stands, use appropriate mechanical, aerial or other techniques to re-establish them. Examples include but are not limited to, use of a Lawson aerator with seeding, harrow or chain with seeding, drill seeding, hand planting plugs, aerial seeding or other appropriate technique.</li> <li>• Cooperative efforts that may improve GRSG habitat quality over multiple ownerships.</li> <li>• Projects that may provide connectivity between suitable habitats or expand existing good quality habitats.</li> <li>• Projects that address conifer encroachment into important GRSG habitats. In general the priority for treatment is 1) Phase 1 (<math>\leq 10\%</math> conifer cover), 2) Phase 2 (10-30%), and 3) Phase 3 (<math>&gt; 30\%</math>).</li> <li>• Replacing stands of annual grasses within otherwise good quality habitats with desirable perennial species. Other factors that contribute to the importance of the restoration project in maintaining or improving GRSG habitat.</li> </ul>
51. When conducting vegetation treatments in areas inhabited or potentially inhabited by slickspot peppergrass ( <i>Lepidium papilliferum</i> ) follow the conservation measures in the applicable conservation agreement between Idaho BLM and US Fish and Wildlife Service (most recent version dated September 2014).

<b>Lands and Realty</b>
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52. Where technically and financially feasible, bury distribution powerlines and communication lines within existing disturbance.
53. Above-ground disturbance areas would be seeded with perennial vegetation as per vegetation management.
54. Place infrastructure in already disturbed locations where the habitat has not been fully restored.

<b>Required Design Feature</b>
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55. Cluster disturbances, operations (fracturing stimulation, liquids gathering, etc.) and facilities as close as possible.
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56. Co-locate linear facilities within one mile of existing linear facilities.
57. Micro-site linear facilities to reduce impacts to sage-grouse habitats.
58. Locate staging areas outside the Priority Habitat Management Areas to the extent possible.
59. Consider colocating powerlines, flowlines and pipelines under or immediately adjacent to a road or adjacent to other pipelines first, before considering co-locating with other ROW.
60. Restrict the construction of tall facilities and fences to the minimum number and amount needed.
61. Use free standing structures where possible, to limit the use of guy wires. Where guy wires are necessary and appropriate bird collision diverters would be used, if doing so would not cause a human safety risk.
62. Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
63. Construction and development activities should conform to seasonal restrictions.
<b>Fluid Mineral Leasing</b>
64. Use directional drilling and/or multi well-pads to reduce surface disturbance.
65. Apply a phased development approach with concurrent reclamation.
66. Place liquid gathering facilities outside of PHMAs. Have no tanks at well locations within PHMAs to minimize truck traffic and perching and nesting sites for ravens and raptors.
67. Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).
68. Site and/or minimize linear ROWs or SUAs to reduce disturbance to sagebrush habitats.
69. Design or site permanent structures which create movement (e.g. pump jack) to minimize impacts to GRSG.
70. Equip tanks and other above-ground facilities with structures or devices that discourage nesting of raptors and corvids.
71. Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007, Evangelista et al. 2011). (E.g. by washing vehicles and equipment.)
72. Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).

<b>Required Design Feature</b>
73. Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat: <ul style="list-style-type: none"> <li>• Overbuild size of ponds for muddy and non-vegetated shorelines.</li> <li>• Build steep shorelines to decrease vegetation and increase wave actions.</li> <li>• Avoid flooding terrestrial vegetation in flat terrain or low lying areas.</li> <li>• Construct dams or impoundments that restrict down slope seepage or overflow.</li> <li>• Line the channel where discharge water flows into the pond with crushed rock.</li> <li>• Construct spillway with steep sides and line it with crushed rock.</li> <li>• Treat waters with larvicides to reduce mosquito production where water occurs on the surface</li> </ul>
74. Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season.
75. The BLM/Forest Service would work with proponents to limit project related noise where it would be expected to reduce functionality of habitats in Priority and Important Habitat Management Areas.
76. The BLM/Forest Service would evaluate the potential for limitation of new noise sources on a case-by-case basis as appropriate.
77. Limit noise sources that would be expected to negatively impact populations in Priority and Important Habitat Management Areas and continue to support the establishment of ambient baseline noise levels for occupied leks in Priority Habitat Management Areas.
78. As additional research and information emerges, specific new limitations appropriate to the type of projects being considered would be evaluated and appropriate limitations would be implemented where necessary to minimize potential for noise impacts on sage- grouse core population behavioral cycles.
79. As new research is completed, new specific limitations would be coordinated with the IDFG and MT FWP and partners.

80. Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
81. Require sage-grouse-safe fences.
82. Locate new compressor stations outside Priority Habitat Management Areas and design them to reduce noise that may be directed towards Priority Habitat Management Areas.
83. Clean up refuse (Bui et al. 2011).
84. Locate man camps outside of priority sage-grouse habitats.

<b>Required Design Feature</b>
85. Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
86. Use only closed-loop systems for drilling operations and no reserve pits.
87. Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
<b>Roads</b>
88. Utilize existing roads, or realignments of existing routes to the extent possible.
89. Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
90. Do not issue ROWs or SUAs to counties on newly constructed energy or mineral development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
91. Establish speed limits on BLM and FS system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
92. Coordinate road construction and use among ROW or SUA holders.
93. Construct road crossings at right angles to ephemeral drainages and stream crossings.
94. Use dust abatement on roads and pads.
95. Close and reclaim duplicate roads by restoring original landform and establishing desired vegetation.
<b>Roads Specific to Priority and Important Habitat Management Areas</b>
96. Locate roads to avoid priority areas and habitats as described in the Wildfire and Invasive Species Assessments.
97. Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
98. Restrict vehicle traffic to only authorized users on newly constructed routes (using signage, gates, etc.)
<b>Reclamation Activities</b>
99. Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011).
100. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
101. Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling and revegetating cut-and-fill slopes.

<b>Required Design Feature</b>
102. Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
103. Irrigate interim reclamation if necessary for establishing seedlings more quickly.
104. Utilize mulching techniques to expedite reclamation and to protect soils.
<b>Grazing</b>
105. Avoid building new wire fences within 2 km of occupied leks (Stevens 2011). If this is not feasible, ensure that high risk segments are marked with collision diverter devices or as latest science indicates.
106. Place new, taller structures, including corrals, loading facilities, water storage tanks, windmills, out of line of sight or at least one kilometer (preferably 3 km) from occupied leks, where such structures would increase the risk of avian predation.
107. Utilize temporary fencing (e.g., ESR, drop down fencing) where feasible and appropriate to meet management objectives.
108. Fence wetlands (e.g., springs, seeps, wet meadows and/or riparian areas) where appropriate, to maintain or foster progress toward Proper Functioning Condition and to facilitate management of sage-grouse habitat objectives. Where constructing fences or exclosures to improve riparian and/or upland management, incorporate fence marking or other BMPs/RDFs as appropriate.

109. During lekking periods, as determined locally (approximately March 15-May 1 in lower elevations and March 25-May 15 in higher elevations), livestock trailing will be avoided to the extent possible within 1 km (0.62 mile) of occupied leks between 6:00 p.m. and 9:00 a.m. to avoid disturbance to lekking and roosting sage-grouse. Over-nighting, watering and sheep bedding locations on public lands must be at least 1 km from occupied leks during the lekking season to reduce disturbance from sheep, human activity and guard animals.
110. Work with permittees in locating sheep over-nighting, watering and sheep bedding locations to minimize impacts to sage-grouse seasonal habitats.
111. When trailing livestock during the lekking or nesting season, use roads or existing trails, to the extent possible to reduce disturbance to roosting, lekking or nesting sage-grouse.
112. Design new spring developments in GRSG habitat to maintain or enhance the free flowing characteristics of springs and wet meadows. Modify developed springs, seeps and associated pipelines to maintain the continuity of the predevelopment riparian area within priority GRSG habitat where necessary.
113. Install ramps in new and existing livestock troughs and open water storage tanks to facilitate the use of and escape from troughs by GRSG and other wildlife.

<b>Required Design Feature</b>
<b>West Nile Virus</b>
114. Construct water return features and maintain functioning float valves to prohibit water from being spilled on the ground surrounding the trough and/or tank and return water to the original water source, to the extent practicable.
115. Minimize the construction of new ponds or reservoirs except as needed to meet important resource management and/or restoration objectives.
116. Develop and maintain non-pond/reservoir watering facilities, such as troughs and bottomless tanks, to provide livestock water.
117. For most spring developments or wells, mosquito breeding habitat usually is not an issue. Flowing cold (less than 50° Fahrenheit) water and steep sides of the stock tanks are not conducive for egg laying or larvae production. If flows are low, the water is warm, or moss production is an issue in the tank, mosquito breeding habitat could exist in the tank.
118. Maintenance of healthy wetlands at spring sources helps control mosquitoes and their larvae by providing habitat for natural predators such as birds, dragonflies and amphibians. Protecting the wetland at the spring source with a fence is an option to consider.
119. Clean and drain stock tanks before the season starts. If never cleaned or drained, many tanks will fill with silt or debris causing warmer water and heavy vegetation growth conducive to mosquito reproduction.
120. Draining tanks after the period of use is completed, particularly in warmer weather, also reduces potential habitat by eliminating stagnant standing water.
121. Maintain a properly functioning overflow to prevent water from flowing onto the pad and surrounding area, to eliminate or minimize pooling of water that is attractive to breeding mosquitoes.
122. Clean or deepen overflow ponds to maintain colder temperatures to reduce mosquito habitat.
123. Install and maintain float valves on stock tank fill pipes to minimize overflow
124. Harden stock tank pads to reduce tracks that can potentially hold water where mosquitoes may breed.
125. Build ponds with steep shorelines to reduce shallow water (>60 cm) and aquatic vegetation around the perimeter of impoundments to deter colonizing by mosquitos (Knight et al. 2003, cited in NTT report page 61).
126. Consider removing and controlling trees and shrubs to reduce shade and wind barriers on pit and reservoir shorelines if not needed for wildlife, fish, or recreational values.
127. Impoundments that remain accessible to livestock and wildlife can cause tracking and nutrient enrichment from manure which can create favorable mosquito breeding habitat. Where this is a concern, it may be desirable to fence the reservoir and pipe the water to a tank.

<b>Required Design Feature</b>
128. Construct dams or impoundments that minimize down-slope seepage or overflow. Seepage and overflow results in down-grade accumulation of vegetated shallow water areas that support breeding mosquitoes.
129. On ponds and reservoirs with enough depth and volume, introduce native fish species, which feed on mosquito larvae.
130. Line the overflow of a dam's spillway with crushed rock and constructing the spillway with steep sides to preclude the accumulation of shallow water and vegetation to reduce mosquito habitat.

131. Where an existing reservoir has filled with silt, consider cleaning to reduce shallow water habitat conducive to mosquito reproduction.
132. During confirmed West Nile virus outbreaks in sage-grouse habitat, consider larvicide applications.
<b>Travel Management</b>
133. Designate or design routes to direct use away from priority areas identified in Wildfire and Invasive Species Assessments and still provide for high-quality and sustainable travel routes and administrative access, legislatively mandated requirements, and commercial needs
<b>Recreation</b>
134. Direct use away from GRSB priority areas as described in the Wildfire and Invasive Species Assessments.
135. Eliminate or minimize external food sources for corvids.
136. Avoid development of new campgrounds or recreation facilities in nesting habitat.

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## Appendix D. Forage Production Estimation

Ecological Site Descriptions (ESDs) provide estimates of above-ground annual dry matter production of common species on a pounds per acre basis. It is important to note that these estimates are based on the “reference state” of an average community, and there could be variation within the reference state based on precipitation, elevation, slope, and other factors that can vary within a particular ESD. These production estimates are provided as a range that could occur due to climatic factors or inherent site characteristics. While there may be variation within an ecological site, as a group, they are capable of producing a distinctive kind and amount of vegetation [Range and Pasture Handbook].

Each ESD also provides a state and transition model describing possible departures from the reference plant community. These departures can vary depending on past disturbance and vegetation responses. States include continuous and reversible vegetation dynamics, while “discontinuous and nonreversible dynamics occur when thresholds are surpassed and one stable state replaces another,” [Briske, Fuhlendorf, & Smeins, 2005].

A typical reference state community found on the Monument is a Loamy 8-12 Wyoming big sagebrush/bluebunch wheatgrass community. In this community total production averages about 750 pounds per acre on an average year. Grasses provide about 60% of the production, shrubs about 25%, and forbs about 15%. However, the majority of the Monument is not in the reference state. Following a wildfire, typically the shrub component would be absent, and grass and forb production would increase, but total production would remain near the 750 pounds per acre mark. This would translate into increased potential forage compared to the reference state.

Within the same ecological site, historic overgrazing may have occurred, resulting in an increase in the shrub component and reduced production and vigor of the grass species. Again, the total production would remain close to 750 pounds per acre, but grasses could provide 30% and shrubs 55% of the total production. This would translate to decreased potential forage compared to the reference state.

Data collected through the HAF for greater sage-grouse were used to determine the percent composition of vegetation species for each ecological site evaluated in the Monument. This composition data was then used to determine in what “state” each area was within each model.

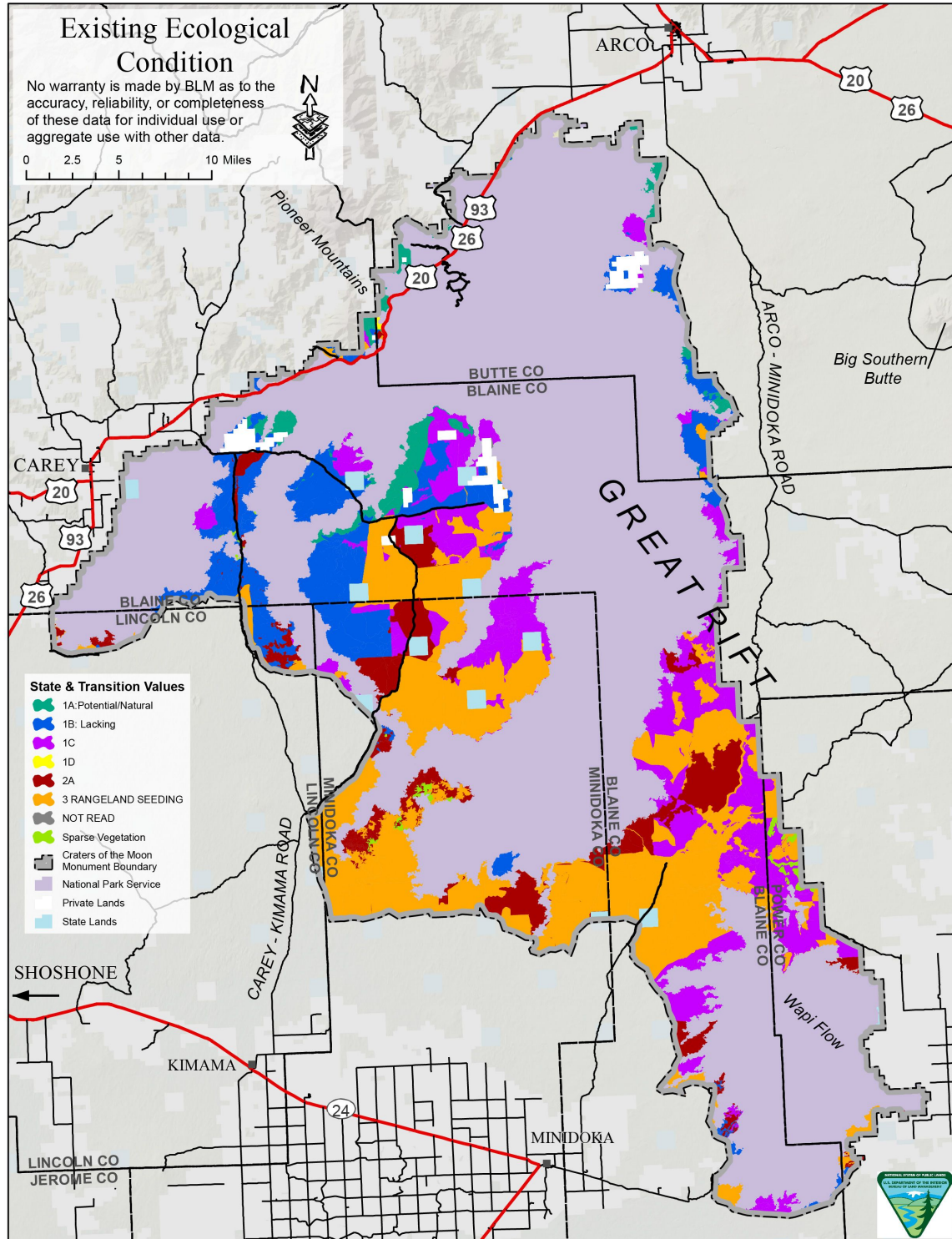
Many areas of the Monument have been seeded to either a crested wheatgrass or native cultivars after wildfires. Generally, these areas crossed a threshold where the native grass and forb species were reduced to the point where natural recovery was not possible. After seeding, these areas would provide similar grass production as indicated in the first wildfire scenario. Total production of the site will likely remain close to that indicated by the ESD, but the relative proportions of shrubs, grasses, and forbs can vary, depending on where the site falls within the state and transition model.

To estimate the potential forage production in the Monument, acreage of each ecological site was multiplied by the annual production values of perennial grasses provided by the NRCS in the ESDs. Therefore total grass production in the Monument based on the ESDs, is 8,6788,388 pounds. This production was then divided by 790, because that is the total pounds required for an Animal Unit Month (AUM) and yields 111,267 AUMs [Range and Pasture Handbook].

There are several characteristics in this number that must be considered. First, this is total production and does not consider use levels that can be sustained without causing harm to the

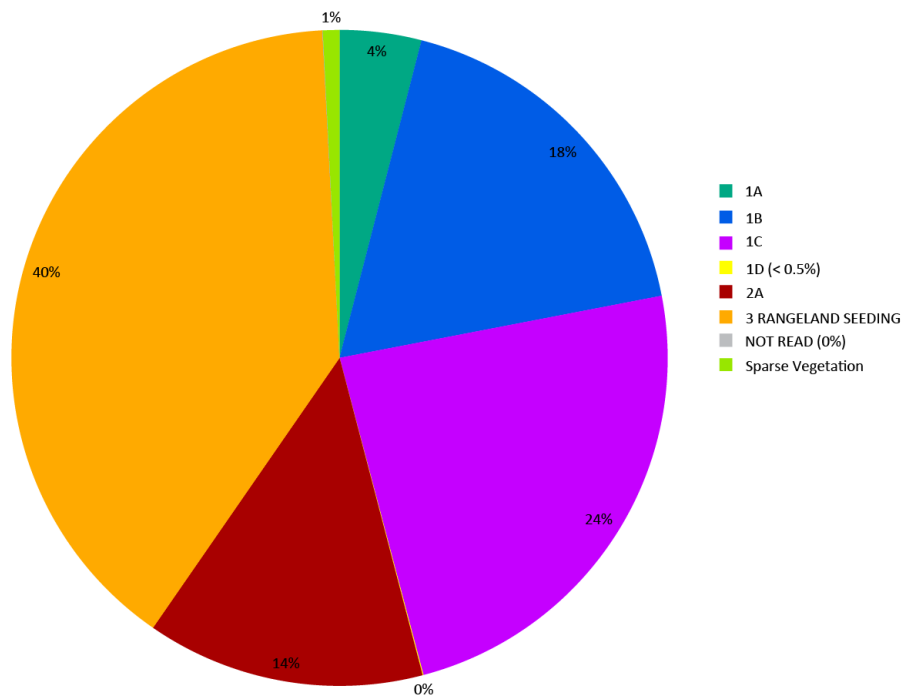
plant community or whether sufficient infrastructure is present to allow livestock access to the forage. Proper use levels depend on species present, and generally range from 20% for some native species to 60% for crested wheatgrass. Second, this figure is based on the low end of the production range. At the high end of the range, production would be about 177,751,822 pounds (227,887 AUMs).

The final consideration is that not all of the Monument is in the reference state. Figure D.1, “Existing Ecological State in Craters of the Moon” shows the relative proportions of the Monument in each state within the state and transition models. State 1 would be the reference community and would average about the same as is represented in the models. Areas in State 2A have crossed a threshold and would be expected to produce less forage than represented in the models. State 3 represents rangeland seedings and would be expected to produce more forage than represented in the models.



**Figure D.1. Existing Ecological State in Craters of the Moon**





**Figure D.2. Proportions of Ecological States in Craters of the Moon**

# Appendix E. Common and Scientific Names of Plant and Animal Species Occurring at Craters of the Moon National Monument & Preserve

**Table E.1. Common and Scientific Names of Plant and Animal Species Occurring at Craters of the Moon National Monument & Preserve**

Type	Common Name	Scientific Name
Trees	Alder	<i>Alnus spp.</i>
	Juniper	<i>Juniperus spp.</i>
	Limber Pine	<i>Pinus flexilis</i>
	Black cottonwood	<i>Populus balsamifera ssp. trichocarpa</i>
	Quaking aspen	<i>Populus tremuloides</i>
	Chokecherry	<i>Prunus virginiana</i>
	Douglas-fir	<i>Pseudotsuga menziesii</i>
	Willow	<i>Salix spp.</i>
Shrubs	Low sagebrush	<i>Artemisia arbuscula</i>
	Basin big sagebrush	<i>Artemisia tridentata ssp. tridentata</i>
	Mountain big sagebrush	<i>Artemisia tridentata ssp. vaseyana</i>
	Wyoming big sagebrush	<i>Artemisia tridentata ssp. wyomingensis</i>
	Threetip sagebrush	<i>Artemisia tripartita</i>
	Desert sweet	<i>Chamaebatiaria millefolium</i>
	Green rabbitbrush	<i>Chrysothamnus viscidiflorus</i>
	Rubber rabbitbrush	<i>Ericameria nauseosa</i>
	Rockspirea	<i>Holodiscus dumosus</i>
	Lewis' mock orange	<i>Philadelphus lewisii</i>
	Antelope bitterbrush	<i>Purshia tridentata</i>
	Mountain snowberry	<i>Symphoricarpos oreophilus</i>
Grasses and Grasslike Plants	Needlegrasses	<i>Achnatherum/Hesperostipa spp.</i>
	Crested wheatgrass	<i>Agropyron cristatum</i>
	Siberian wheatgrass	<i>Agropyron fragile</i>
	Cheatgrass	<i>Bromus tectorum</i>
	Snake River wheatgrass	<i>Elymus wawawaiensis</i>
	Idaho fescue	<i>Festuca idahoensis</i>
	Western wheatgrass	<i>Pascopyrum smithii</i>
	Sherman's big bluegrass	<i>Poa ampla</i>
	Sandberg bluegrass	<i>Poa secunda</i>
	Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>
	tall wheatgrass	<i>Thinopyrum ponticum</i>
	sixweeks fescue	<i>Vulpia octiflora</i>
Forbs	Russian knapweed*	<i>Acroptilon repens</i>
	Meadow pussytoes°	<i>Antennaria arcuata</i>
	Milkvetch	<i>Astragalus spp.</i>
	Goose Creek milkvetch	<i>Astragalus anserinus</i>
	Mourning milkvetch°	<i>Astragalus atratus var. insepatus</i>
	Basalt milkvetch	<i>Astragalus filipes</i>
	Picabo milkvetch°	<i>Astragalus oniciformis</i>
	Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>
	Musk thistle*	<i>Carduus nutans</i>

Appendix E Common and Scientific Names of Plant  
and Animal Species Occurring at Craters of the  
Moon National Monument & Preserve

Type	Common Name	Scientific Name
	Diffuse knapweed*	<i>Centaurea diffusa</i>
	Spotted knapweed*	<i>Centaurea stoebe</i>
	Rush skeletonweed*	<i>Chondrilla juncea</i>
	Canada thistle*	<i>Cirsium arvense</i>
	Field bindweed*	<i>Convolvulus arvensis</i>
	Buckwheats	<i>Eriogonum spp.</i>
	Leafy spurge*	<i>Euphorbia esula</i>
	Dyer's woad*	<i>Isatis tinctoria</i>
	Dalmation toadflax*	<i>Linaria dalmatica</i>
	Flax	<i>Linum spp.</i>
	Lupine	<i>Lupinus spp.</i>
	Alfalfa	<i>Medicago sativa</i>
	False dandelion	<i>Nothocalais troximoides</i>
	Sainfoin	<i>Onobrychis viciifolia</i>
	Scotch thistle*	<i>Onopordum acanthium</i>
	Penstemon	<i>Penstemon spp.</i>
	Idaho Penstemon	<i>Penstemon montanus var. Idahoensis</i>
	Obscure phacelia°	<i>Phacelia inconspicua</i>
	Phlox	<i>Phlox spp.</i>
	Sticky cinquefoil	<i>Potentilla glandulosa</i>
	Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Amphibians	Western toad	<i>Anaxyrus boreas</i>
	Boreal chorus frog	<i>Pseudacris maculate</i>
	Pacific tree frog	<i>Pseudacris regilla</i>
	Great Basin spadefoot	<i>Spea intermontana</i>
Birds	Cooper's hawk +	<i>Accipiter cooperii</i>
	Northern goshawk +	<i>Accipiter gentilis</i>
	Sharp-shinned hawk +	<i>Accipiter striatus</i>
	Spotted sandpiper +	<i>Acitis macularia</i>
	Western grebe +	<i>Aechmophorus occidentalis</i>
	Northern saw-whet owl +	<i>Aegolius acadicus</i>
	White-throated swift +	<i>Aeronautes saxatalis</i>
	Red-winged blackbird +	<i>Agelaius phoeniceus</i>
	Chukar	<i>Alectoris chukar</i>
	Grasshopper sparrow +	<i>Ammodramus savannarum</i>
	Sagebrush sparrow +	<i>Artemisiospiza nevadensis</i>
	Black-throated sparrow +	<i>Amphispiza bilineata</i>
	Northern pintail +	<i>Anas acuta</i>
	American wigeon +	<i>Anas americana</i>
	Northern shoveler +	<i>Anas clypeata</i>
	Green-winged teal +	<i>Anas crecca</i>
	Cinnamon teal +	<i>Anas cyanoptera</i>
	Blue-winged teal +	<i>Anas discors</i>
	Mallard +	<i>Anas platyrhynchos</i>
	Gadwall +	<i>Anas strepera</i>
	American pipet +	<i>Anthus rubescens</i>
	Golden eagle +	<i>Aquila chrysaetos</i>
	Black-chinned hummingbird +	<i>Archilochus alexandri</i>
	Great blue heron +	<i>Ardea herodias</i>
	Short-eared owl +	<i>Asio flammeus</i>
	Long-eared owl +	<i>Asio otus</i>
	Western burrowing owl +	<i>Athene cunicularia</i>
	Lesser scaup +	<i>Aythya affinis</i>

Type	Common Name	Scientific Name
	Redhead +	<i>Aythya americana</i>
	Ring-necked duck +	<i>Aythya collaris</i>
	Canvasback +	<i>Aythya valisineria</i>
	Cedar waxwing +	<i>Bombycilla cedrorum</i>
	Bohemian waxwing +	<i>Bombycilla garrulus</i>
	Ruffed grouse	<i>Bonasa umbellus</i>
	Canada goose +	<i>Branta canadensis</i>
	Great horned owl +	<i>Bubo virginianus</i>
	Bufflehead +	<i>Bucephala albeola</i>
	Common goldeneye +	<i>Bucephala clangula</i>
	Red-tailed hawk +	<i>Buteo jamaicensis</i>
	Rough-legged hawk +	<i>Buteo lagopus</i>
	Ferruginous hawk +	<i>Buteo regalis</i>
	Swainson's hawk +	<i>Buteo swainsonii</i>
	Lark bunting +	<i>Calamospiza melanocorys</i>
	Common redpoll +	<i>Carduelis flammea</i>
	Hoary redpoll +	<i>Carduelis hornemanni</i>
	Pine siskin +	<i>Carduelis pinus</i>
	American goldfinch +	<i>Carduelis tristis</i>
	Cassin's finch +	<i>Carpodacus cassinii</i>
	House finch +	<i>Carpodacus mexicanus</i>
	Turkey vulture +	<i>Cathartes aura</i>
	Hermit thrush +	<i>Catharus guttas</i>
	Swainson's thrush +	<i>Catharus ustulatus</i>
	Greater sage-grouse	<i>Centrocercus urophasianus</i>
	Brown creeper +	<i>Certhia americana</i>
	Belted kingfisher +	<i>Ceryle alcyon</i>
	Killdeer +	<i>Charadrius vociferus</i>
	Snow goose +	<i>Chen caerulescens</i>
	Black tern +	<i>Chlidonias niger</i>
	Lark sparrow +	<i>Chondestes grammacus</i>
	Common nighthawk +	<i>Chordeiles minor</i>
	American dipper +	<i>Cinclus mexicanus</i>
	Northern harrier +	<i>Circus cyaneus</i>
	Marsh wren +	<i>Cistothorus palustris</i>
	Evening grosbeak +	<i>Coccothraustes vespertinus</i>
	Northern flicker +	<i>Colaptes auratus</i>
	Band-tailed pigeon +	<i>Columba fasciata</i>
	Rock pigeon	<i>Columba livia</i>
	Olive-sided flycatcher +	<i>Contopus cooperi</i>
	Western wood-pewee +	<i>Contopus sordidulus</i>
	American crow +	<i>Corvus brachyrhynchos</i>
	Common raven +	<i>Corvus corax</i>
	Stellar's jay +	<i>Cyanocitta stelleri</i>
	Tundra swan +	<i>Cygnus columbianus</i>
	Blue grouse	<i>Dendragapus obscurus</i>
	Yellow-rumped warbler +	<i>Dendroica coronata</i>
	Yellow warbler +	<i>Dendroica petechia</i>
	Townsend's warbler +	<i>Dendroica townsendii</i>
	Bobolink +	<i>Dolichonyx oryzivorus</i>
	Gray catbird +	<i>Dumetella carolinensis</i>
	Hammond's flycatcher +	<i>Empidonax hammondii</i>
	Dusky flycatcher +	<i>Empidonax oberholseri</i>

Type	Common Name	Scientific Name
	Cordilleran flycatcher +	<i>Empidonax occidentallis</i>
	Willow flycatcher +	<i>Empidonax traillii</i>
	Gray flycatcher +	<i>Empidonax wrighti</i>
	Horned lark +	<i>Eremophilla alpestris</i>
	Brewer's blackbird +	<i>Euphagus cyanocephalus</i>
	Merlin +	<i>Falco columbarius</i>
	Prairie falcon +	<i>Falco mexicanus</i>
	Peregrine falcon +	<i>Falco peregrinus</i>
	Gyr falcon +	<i>Falco rusticolus</i>
	American kestrel +	<i>Falco sparverius</i>
	American coot +	<i>Filica americana</i>
	Wilson's snipe +	<i>Gallinago gallinago</i>
	Sandhill crane +	<i>Grus canadensis</i>
	Pinyon jay +	<i>Gymnorhinus cyanocephalus</i>
	Bald eagle +	<i>Haliaeetus leucocephalus</i>
	Barn swallow +	<i>Hirunda rustica</i>
	Yellow-breasted chat +	<i>Icteria virens</i>
	Bullock's oriole +	<i>Icterus bullockii</i>
	Varied thrush +	<i>Ixoreus naevius</i>
	Dark-eyed junco +	<i>Junco hyemalis</i>
	Northern shrike +	<i>Lanius excubitor</i>
	Loggerhead shrike +	<i>Lanius ludovicianus</i>
	Herring gull +	<i>Larus argentatus</i>
	California gull +	<i>Larus californicus</i>
	Ring-billed gull +	<i>Larus delawarensis</i>
	Franklin's gull +	<i>Larus pipixan</i>
	Black rosy-finch +	<i>Leucosticte atrata</i>
	Gray-crowned rosy-finch +	<i>Leucosticte tephrocotis</i>
	Long-billed dowitcher +	<i>Limnodromus scolopaceus</i>
	Red crossbill +	<i>Loxia curvirostra</i>
	Western screech owl +	<i>Megascops kennicottii</i>
	Red-headed woodpecker +	<i>Melanerpes erythrocephalus</i>
	Lewis's woodpecker +	<i>Melanerpes lewis</i>
	Lincoln's sparrow +	<i>Melospiza lincolni</i>
	Song sparrow +	<i>Melospiza melodia</i>
	Brown-headed cowbird +	<i>Molothrus ater</i>
	Townsend's solitaire +	<i>Myadestes townsendi</i>
	Ash-throated flycatcher +	<i>Myiarchus cinerascens</i>
	Clark's nutcracker +	<i>Nucifraga columbiana</i>
	Long-billed curlew +	<i>Numenius americanus</i>
	Whimbrel +	<i>Numenius phaeopus</i>
	Snowy owl +	<i>Nyctea scandiaca</i>
	MacGillivray's warbler +	<i>Oporornis tolmiei</i>
	Sage thrasher +	<i>Orreoscoptes montanus</i>
	Ruddy duck +	<i>Oxyura jamaicensis</i>
	Osprey +	<i>Pandion haliaetus</i>
	House sparrow	<i>Passer domesticus</i>
	Savannah sparrow +	<i>Passerculus sandwichensis</i>
	Lazuli bunting +	<i>Passerina amoena</i>
	Fox sparrow +	<i>Passerlla iliaca</i>
	American white pelican +	<i>Pelecanus erythrorhynchos</i>
	Gray partridge +	<i>Perdix perdix</i>
	Cliff swallow +	<i>Petrochelidon pyrrhonota</i>

Type	Common Name	Scientific Name
	Common poorwill +	<i>Phalaenoptilus</i>
	Wilson's phalarope +	<i>Phalaropus tricolor</i>
	Ring-necked pheasant	<i>Phasianus colchicus</i>
	Black-headed grosbeak +	<i>Pheucticus melanocephalus</i>
	Black-billed magpie +	<i>Pica hudsonia</i>
	Downy woodpecker +	<i>Picoides pubescens</i>
	Hairy woodpecker +	<i>Picoides villosus</i>
	Pine grosbeak +	<i>Pinicola enucleator</i>
	Green-tailed towhee +	<i>Pipilo chlorurus</i>
	Spotted towhee +	<i>Pipilo maculatus</i>
	Western tanager +	<i>Piranga ludoviciana</i>
	Snow bunting +	<i>Plectrophenax nivalis</i>
	White-faced ibis +	<i>Plegadis chihi</i>
	Eared grebe +	<i>Podiceps nigricollis</i>
	Pied-billed grebe +	<i>Podilymbus podiceps</i>
	Black-capped chickadee +	<i>Poecile atricapilla</i>
	Mountain chickadee +	<i>Poecile gambeli</i>
	Blue-gray gnatcatcher +	<i>Poliophtila caerulea</i>
	Vesper sparrow +	<i>Pooecetes gramineus</i>
	Sora +	<i>Porzana carolina</i>
	Common grackle +	<i>Quiscalus quiscula</i>
	Virginia rail +	<i>Rallus limicola</i>
	American avocet +	<i>Recurvirostra americana</i>
	Ruby-crowned kinglet +	<i>Regulus calendula</i>
	Golden-crowned kinglet +	<i>Regulus satrapa</i>
	Rock wren +	<i>Salpinctes obsoletus</i>
	Say's phoebe +	<i>Sayornis saya</i>
	Northern waterthrush +	<i>Seiurus noveboracensis</i>
	Broad-tailed hummingbird +	<i>Selasphorus platycercus</i>
	Rufous hummingbird +	<i>Selasphorus rufus</i>
	American redstart +	<i>Setophaga ruticilla</i>
	Mountain bluebird +	<i>Sialia currucoides</i>
	Western bluebird +	<i>Sialia mexicana</i>
	Red-breasted nuthatch +	<i>Sitta canadensis</i>
	White-breasted nuthatch +	<i>Sitta carolinensis</i>
	Red-naped sapsucker +	<i>Sphyrapicus nuchallis</i>
	Williamson's sapsucker +	<i>Sphyrapicus thyroideus</i>
	Brewer's sparrow +	<i>Spizella breweri</i>
	Chipping sparrow +	<i>Spizella passerina</i>
	Northern rough-winged swallow +	<i>Stelgidopteryx serripennis</i>
	Calliope hummingbird +	<i>Selasphorus calliope</i>
	Forster's tern +	<i>Sterna forsteri</i>
	Western meadowlark +	<i>Sturnella neglecta</i>
	European starling	<i>Sturnus vulgaris</i>
	Tree swallow +	<i>Tachycineta bicolor</i>
	Violet-green swallow +	<i>Tachycineta thalassina</i>
	Brown thrasher +	<i>Toxostoma rufum</i>
	House wren +	<i>Troglodytes aedon</i>
	Winter wren +	<i>Troglodytes troglodytes</i>
	American robin +	<i>Turdus migratorius</i>
	Eastern kingbird +	<i>Tyrannus tyrannus</i>
	Western kingbird +	<i>Tyrannus verticalis</i>
	Orange-crowned warbler +	<i>Vermivora celata</i>

Type	Common Name	Scientific Name
	Tennessee warbler +	<i>Vermivora pergrina</i>
	Nashville warbler +	<i>Vermivora ruficapilla</i>
	Cassin's vireo +	<i>Vireo cassinii</i>
	Warbling vireo +	<i>Vireo gilvus</i>
	Plumbeous vireo +	<i>Vireo plumbeus</i>
	Wilson's warbler +	<i>Wilsonia pusilla</i>
	Yellow-headed blackbird +	<i>Xanthocephalus xanthocephalus</i>
	Mourning dove +	<i>Zenaida macroura</i>
	White-throated sparrow +	<i>Zonotrichia albicollis</i>
	Golden-crowned sparrow +	<i>Zonotrichia atricapilla</i>
	White-crowned sparrow +	<i>Zonotrichia leucophrys</i>
Mammals	Moose	<i>Alces alces</i>
	Pronghorn	<i>Antilocapra americana</i>
	Pallid bat	<i>Antrozous pallidus</i>
	Pygmy rabbit	<i>Brachylagus idahoensis</i>
	Coyote	<i>Canis latrans</i>
	Gray wolf	<i>Canis lupus</i>
	Beaver	<i>Castor canadensis</i>
	Elk	<i>Cervus elephas</i>
	Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
	Ord's kangaroo rat	<i>Dipodomys ordii</i>
	Big brown bat	<i>Eptesicus fuscus</i>
	Porcupine	<i>Erethizon dorsatum</i>
	Mountain lion	<i>Felis concolor</i>
	Sagebrush vole	<i>Lagurus curtatus</i>
	Snowshoe hare	<i>Lepus americanus</i>
	White-tailed jackrabbit	<i>Lepus californicus</i>
	Black-tailed jackrabbit	<i>Lepus townsendii</i>
	Bobcat	<i>Lynx rufus</i>
	Yellow-bellied marmot	<i>Marmota flaviventris</i>
	Striped skunk	<i>Mephitis mephitis</i>
	Long-tailed vole	<i>Microtus longicaudus</i>
	Montane vole	<i>Microtus montanus</i>
	Short-tailed weasel	<i>Mustela ermina</i>
	Long-tailed weasel	<i>Mustela frenata</i>
	California myotis	<i>Myotis californicus</i>
	Long-eared myotis	<i>Myotis evotis</i>
	Small-footed myotis	<i>Myotis leibii</i>
	Little brown myotis	<i>Myotis lucifugus</i>
	Fringed myotis	<i>Myotis thysanodes</i>
	Long-legged myotis	<i>Myotis volans</i>
	Bushy-tailed woodrat	<i>Neotoma cinerea</i>
	Pika	<i>Ochotona princeps</i>
	Mule deer	<i>Odocoileus hemionus</i>
	Muskrat	<i>Ondatra zibethicus</i>
	Great Basin pocket mouse	<i>Perognathus parvus</i>
	Deer mouse	<i>Peromyscus maniculatus</i>
	Heather vole	<i>Phenacomys intermedius</i>
	Raccoon	<i>Procyon lotor</i>
	Western harvest mouse	<i>Reithrodontomys megalotis</i>
	Merriam's shrew	<i>Sorex merriami</i>
	Dusky shrew	<i>Sorex monticolus</i>
	Vagrant shrew	<i>Sorex vagrans</i>

Type	Common Name	Scientific Name
	Columbian ground squirrel	<i>Spermophilus columbianus</i>
	Golden-mantled ground squirrel	<i>Spermophilus lateralis</i>
	Piute ground squirrel	<i>Spermophilus mollis</i>
	Western spotted skunk	<i>Spilogale gracilis</i>
	Mountain cottontail	<i>Sylvilagus nuttallii</i>
	Yellow-pine chipmunk	<i>Tamias amoenus</i>
	Least chipmunk	<i>Tamias minimus</i>
	Red squirrel	<i>Tamiasciurus hudsonicus</i>
	Badger	<i>Taxidea taxus</i>
	Northern pocket gopher	<i>Thomomys talpoides</i>
	Black bear	<i>Ursus americanus</i>
	Kit fox	<i>Vulpes macrotis</i>
	Red fox	<i>Vulpes vulpes</i>
	Western jumping mouse	<i>Zapus princeps</i>
Reptiles	Rubber boa	<i>Charina bottae</i>
	Western yellow-bellied racer	<i>Coluber constrictor</i>
	Western rattlesnake	<i>Crotalus viridis</i>
	Western skink	<i>Eumeces skiltonianus</i>
	Longnose leopard lizard	<i>Gambelia wislizenii</i>
	Short-horned lizard	<i>Phrynosoma douglasii</i>
	Desert horned lizard	<i>Phrynosoma platyrhinos</i>
	Gopher snake	<i>Pituophis catenifer</i>
	Sagebrush lizard	<i>Sceloporus graciosus</i>
	Western terrestrial garter snake	<i>Thamnophis elegans</i>
*Noxious Weeds		
° Rare Plants		
+Species protected by the Migratory Bird Treaty Act		



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# Appendix F. Greater Sage-Grouse Habitat Assessment Framework

## Assessing Site-Scale Habitat Suitability in the Craters of the Moon National Monument & Preserve <sup>1</sup>

### Overview

Habitat assessments for greater sage-grouse were conducted on BLM lands in the Craters of the Moon National Monument and Preserve (the Monument) during the summers of 2012 and 2013. These data were used to characterize the suitability of areas for breeding, summer, and winter use by sage-grouse. Information regarding the protocols and project design can be reviewed in the text and appendices of the *BLM Sage-grouse Habitat Assessment Framework Manual* [Stiver et al., 2010];[ Stiver et al., 2015]

Based on extensive research in many western states, Connelly et al. (2000) developed and Hagen, Connelly, and Schroeder (2007) refined habitat criteria or indicators required by sage-grouse for specific seasonal needs. Generalized seasonal habitats are characterized as occurring during breeding, summer, and winter. Breeding habitat provides for the life-cycle activities of lekking, pre-laying, nesting, and early brood-rearing. Summer habitat includes areas used by sage-grouse during late brood-rearing. Winter habitat describes areas used from late fall through winter, when sagebrush becomes increasingly important for food and cover. Connelly et al. (2000) provides extensive treatment of each of these seasonal ranges.

Seasonal habitat suitability matrices were based primarily on Connelly et al. (2000) because they used data collected across the species' range. Habitat indicators for sage-grouse within seasonal habitats included sagebrush canopy cover, sagebrush height, sagebrush shape, perennial grass and forb heights, perennial grass and forb canopy cover, and preferred forb availability. For the purpose of standardizing habitat descriptions, discrete ranges of numeric values or other measurements (e.g., visual site guides) were used to describe seasonal habitat indicators as suitable, marginal, or unsuitable [Sather-Blair, Makela, Carrigan, & Anderson, 2000].

There is a tendency to review each indicator and its suitability category independently, but site suitability is determined by the relationship among indicator values. The suitability expectations for these matrices are based on range-wide data, and the term "suitable" is not synonymous with "optimum." Although general criteria were recommended, Connelly et al. (2000) recognized that ecological site potential should also be considered at the site scale.

In general, suitable habitats provided the appropriate protective cover (sagebrush and herbaceous plants), food (forbs and sagebrush), and security (proximity of trees and tall structures for predators) needs for sage-grouse to survive and reproduce [Connelly et al., 2000]; [Sather-Blair et al., 2000]. Marginal habitats included habitat components to support sage-grouse but habitat conditions were lower in quality compared to suitable habitats. It was assumed that survival rates and reproduction were lower in marginal habitats compared to suitable habitats [Cooperrider, Boyd, & Stuart, 1986]; [Morrison, Marcot, & Mannan, 1998]. Unsuitable habitats were currently missing one or more of the basic life requisites of food or shelter, though they may have the potential to provide these life requisites in the future [Stiver et al., 2010].

### Breeding Habitat

<sup>1</sup>Distilled from Stiver et al. (2010)

In the Monument, breeding activities generally occur from March 15 to June 15. Leks can be found at a variety of locations but are generally located in relatively open areas adjacent to denser sagebrush cover. Such sites include meadows, openings created by fires or roads, areas of low sagebrush, windswept ridges, exposed knolls, or dry lake beds. Most leks are traditional and are used year after year [Patterson, 1952]; [Connelly et al., 2004].

Productive nesting areas are typically characterized by sagebrush with an understory of native grasses and forbs, with horizontal and vertical structural diversity that provides an insect prey base, herbaceous forage for pre-laying and nesting hens, and cover for the hen while she is incubating [Gregg, 1991]; [Connelly et al., 2000]; [Connelly et al., 2004]. Sage-grouse also may use other shrub or bunchgrass species for nest sites [Klebenow, 1969]; [Connelly et al., 2000]; [Connelly et al., 2004]; however, nests under shrubs other than sagebrush are generally less successful [Connelly, Wakkinen, Apa, & Reese, 1991].

Shrub canopy and grass cover provide concealment for sage-grouse nests and chicks, which is critical for reproductive success [Gregg et al., 1994]; [DeLong, Crawford, & DeLong, 1995]; [Connelly et al., 2004]. Published vegetation characteristics of successful nest sites include a sagebrush canopy cover of 15-25%, sagebrush heights of 12-32 in (30-80 cm), and grass/forb cover of at least 7 in (18 cm) ([Connelly et al., 2000]; Table D-1). Cover values for Sandberg bluegrass are not included in the cover estimate for perennial grasses due to the relatively low contribution the plant provides as concealment cover for sage-grouse nesting and early brood-rearing [Stiver et al., 2015].

**Table F.1. Breeding habitat life requisites, indicators, and suitability categories for site-scale habitat descriptions (adapted from Connelly et al. (2000), Sather-Blair et al. (2000), and Hagen et al. (2007)).**

Life Requisite	Habitat Indicator	Suitable	Marginal	Unsuitable
<b>Cover</b>	Sagebrush Canopy Cover (%)	15 to 25	5 to < 15 or > 25	< 5
	Sagebrush Height: Mesic Site <sup>1</sup> (in)	16 to 32	8 to < 16 or > 32	< 8
	Sagebrush Height: Arid Site (in)	12 to 32	8 to < 12 or > 32	< 8
	Sagebrush Shape	Spreading	Mix of spreading and columnar	Columnar
	Herbaceous Height (in)	≥ 7	4 to < 7	< 4
	Perennial Grass Cover: Mesic Site (%)	≥ 15	5 to < 15	< 5
	Perennial Grass Cover: Arid Site (%)	≥ 10	5 to < 10	< 5
<b>Cover and Food</b>	Forb Canopy Cover: Mesic Site (%)	≥ 10	5 to < 10	< 5
	Forb Canopy Cover: Arid Site (%)	≥ 5	3 to < 5	< 3
<b>Food</b>	Preferred Forb Availability <sup>2</sup>	Preferred forbs are common with several species present	Preferred forbs are common but only a few preferred species are present	Preferred forbs are rare

## Note

**1** Mesic and arid sites were defined on a local basis; annual precipitation, herbaceous understory, and soils were considered [Connelly et al., 2000].

**2** Relative to ecological site potential.

The numeric values described for productive habitat by Connelly et al. (2000) are guidelines and are not intended to be used as strict prescriptions [Stiver et al., 2010]. Although sagebrush canopy cover is a crucial habitat indicator, the composition and percent cover of shrubs other than sagebrush can positively affect site suitability in certain circumstances. For example, sagebrush may only provide 10% canopy cover in a particular location, but antelope bitterbrush is also present with a canopy cover of 5%. Here, the density of bitterbrush positively affects the overall site suitability [Stiver et al., 2010]. Conversely, areas with an excess canopy cover (25-35%) of three-tip sagebrush can also provide suitable nesting habitat, provided that forb abundance and grass cover are adequate relative to the site potential [Klebenow, 1969]; [Dobkin, 1995]. Slopes > 40% generally do not provide suitable nesting habitat for sage-grouse [Idaho Sage-grouse Advisory Committee (ISAC), 2006], regardless of their vegetative characteristics. However, low sagebrush communities present on these sites provide important foraging habitat for adult sage-grouse year-round.

## Summer Habitat

As sagebrush areas desiccate during late June and July, sage-grouse move to more mesic sites with succulent forbs [Connelly, Browsers, & Gates, 1988]. Late summer brood-rearing habitat may include sagebrush, relatively small burned areas within sagebrush, wet meadows, farmland, and other irrigated areas adjacent to sagebrush communities. Proximity to taller sagebrush communities may be an important habitat indicator in some situations. For instance, some brood-rearing habitat occurs in forb-rich low sagebrush communities adjacent to big sagebrush communities. In other cases, the available forbs such as arrowleaf balsamroot may be providing additional cover in low sagebrush communities, especially for very young broods (< 21 days old). In the Monument, summer habitats are generally used by sage-grouse from June 16 to October 15. Late summer brood-rearing habitat generally overlaps early summer brood-rearing habitat, especially during years of above-average summer precipitation.

The indicators for upland summer habitats are similar to those described for breeding habitat, but the ranges for the suitability categories differ (Table D–2). Here, the percent cover of sagebrush is less important than the total amount of cover provided by sagebrush and other shrubs, as well as mid-sized perennial bunchgrasses. The abundance and diversity of late-season upland forbs also contributes significantly to the value of summer habitats for sage-grouse.

**Table F.2. Summer habitat life requisites, indicators, and suitability categories for upland sagebrush site-scale habitat descriptions (adapted from Connelly et al. (2000), Sather-Blair et al. (2000), and Hagen et al. (2007)).**

Life Requisite	Habitat Indicator	Suitable	Marginal	Unsuitable
Cover	Sagebrush Canopy Cover (%)	10 to 25	5 to < 10 or > 25	< 5
	Sagebrush Height (in)	16 to 32	8 to < 16 or > 32	< 8

<b>Cover and Food</b>	Perennial Grass and Forb Canopy Cover (%)	$\geq 15$	5 to < 15	< 5
<b>Food</b>	Preferred Forb Availability <sup>1</sup>	Preferred forbs are common with several species present	Preferred forbs are common but only a few preferred species are present	Preferred forbs are rare

### Note

<sup>1</sup> Relative to ecological site potential.

## Winter Habitat

Characteristics of wintering areas used by sage-grouse are relatively similar throughout the species' range [ISAC, 2006]. Sage-grouse generally select winter habitats based on topography, snow depth, and the availability of sagebrush above snow level (Table D–3). Sage-grouse are known to forage on windblown ridges and south- and west-facing aspects during late fall and winter, in addition to lower-elevation areas of dense sagebrush [ISAC, 2006] with heights of 10-12 in (25-30 cm) above the snow. Big sagebrush dominates the diet in most portions of the range [Patterson, 1952]; [Welch, Pederson, & Rodriguez, 1988]; [Welch, Wagstaff, & Roberson, 1991], although low sagebrush and black sagebrush are consumed in many areas depending on availability. In the Monument, late fall and winter habitats are generally used by sage-grouse from October 16 to March 14.

**Table F.3. Winter habitat life requisites, indicators, and suitability categories for site-scale habitat descriptions (adapted from Connelly et al. (2000), Sather-Blair et al. (2000), and Hagen et al. (2007)).**

Life Requisite	Habitat Indicator	Suitable	Marginal	Unsuitable
<b>Cover and Food</b>	Sagebrush Canopy Cover (%)	$\geq 10$	5 to < 10	< 5
	Sagebrush Height Above Snow (in)	> 10	> 4 to < 10	$\leq 4$

# **Appendix G. Greater Sage-Grouse Occupied Seasonal Habitat Methodology on Craters of the Moon BLM National Monument Lands**

## *Overview*

Greater sage-grouse select seasonal habitats within their home ranges during breeding, summer, fall, and winter periods [Johnson, 1980]; [Connelly et al., 2004]. For many wildlife species with large home ranges, including sage-grouse, seasonal life requisite needs differ and movement is required to acquire shelter and forage. Their diet shifts from insects and forbs during breeding and summer to sagebrush during late fall and winter [Connelly et al., 2004]. Sage-grouse are generally traditional in their seasonal movement patterns [Connelly et al., 2004]. Some sage-grouse may move long distances (>18 mi) between breeding and summer and summer and winter habitats; others are non-migratory and tend to use areas year-round, although use areas may differ at finer scales.

Occupied seasonal habitats for sage-grouse in the Craters of the Moon National Monument and Preserve (the Monument) were mapped by the BLM in cooperation with the Idaho Department of Fish and Game (IDFG). Historic and current data as well as local knowledge of sage-grouse experts were used to help identify seasonal use areas and to determine the migratory status of the local sage-grouse population. Three main sage-grouse seasonal use areas (breeding, summer, and late fall-winter) were identified. In many areas of the Monument, seasonal habitats overlapped or were occupied by sage-grouse year-round.

Future information from winter flights, telemetry, and observation data would be beneficial to further refine the occupied habitat maps for the Monument. The products from this effort are meant to be “working drafts” and should be updated as new information is presented.

## *Breeding Habitat*

The breeding period for sage-grouse in the Monument typically occurs from March 15 to June 15 [North Magic Valley Sage-grouse Local Working Group (NMVLWG), 2009]. During this time, sage-grouse attend leks to breed, prepare nutritionally for nesting, nest, and raise young chicks [Connelly et al., 2000]. Breeding habitat is not just nesting habitat but includes all areas the birds may use during this time. Sagebrush cover types within 11 miles (18 km) of a lek for migratory populations and 3.1 miles (5 km) for non-migratory populations generally provide breeding habitat for sage-grouse [Stiver et al., 2010]. The Monument appears to support both migratory and non-migratory sage-grouse populations [NMVLWG, 2009].

Sources used to identify occupied breeding areas included: sage-grouse observations and breeding habitat maps provided by the NMV LWG, observations in land management and wildlife agency files, telemetry data, lek survey data, and vegetation maps (i.e., existing vegetation, Key habitat, and field data points of  $\geq 5\%$  shrub cover collected utilizing the Sage-grouse Habitat Assessment Framework as described in Stiver et al. (2010)). Occupied breeding habitats were delineated based largely on the presence of sagebrush, occupied leks, and/or breeding sage-grouse observation data (primarily from telemetry studies). In general, areas within 3.1 miles of occupied leks were mapped as occupied breeding habitat. Occupied breeding habitat was also delineated in areas highly suspected of supporting sage-grouse breeding activities outside of the 3.1-mile lek buffer.

Specifically, we used GIS to overlay spatial data of sage-grouse occurrence and sagebrush communities in and adjacent to the Monument. We used the NMVLWG spatial data, which delineates breeding habitat across the west half of the Monument [NMVLWG, 2009]. We combined this data with existing sagebrush communities and areas within 3.1 miles of occupied leks (IDFG state-wide lek database, 2012) in and adjacent to the Monument. GIS shapefiles of sage-grouse observations were also compiled from IDFG telemetry studies (Palmer, 1991-1995; Lowe, 2004-2006; IDFG/BLM, 2012-2014), falconer GPS locations (King, 2000-2008; Skinner, 2007-2008; Greene, 2008), and BLM and other agency observation data (BLM, 1991-2013). Finally, any remaining areas that were not already included from the ARMPA greater sage-grouse nesting and brood-rearing GIS layer was included. Approximately 248,900 acres of BLM Monument lands were mapped as occupied breeding habitat.

Observation and telemetry data points of sage-grouse were generally captured within the NMVLWG breeding habitat and the occupied lek buffers. Outlying areas containing sage-grouse observation data were also included in the occupied breeding habitat if the data was  $\leq 10$  years old [Stiver et al., 2010]. Areas containing sage-grouse observation data  $> 10$  years old remained identified as occupied breeding habitat if sagebrush cover was  $\geq 5\%$  (considered marginal to suitable habitat, [Stiver et al., 2010]). In addition, sagebrush and associated vegetation communities contiguous with areas of recent known use ( $\leq 10$  years old), which did not have effective barriers to sage-grouse movement from known use areas, were considered occupied unless specific information existed that documented the lack of sage-grouse use [Stiver et al., 2010]. Some of the mapped, occupied breeding areas do not currently provide suitable breeding habitat (e.g., [Stiver et al., 2010]) for sage-grouse due to plant structure characteristics, edaphic conditions, slope, aspect, or other factors. However, at the scale of the seasonal home range, these areas likely provide for the life-cycle activities of the local sage-grouse population.

Areas that were not delineated as occupied breeding habitat did not contain verified sage-grouse observations or recent lek activity. In addition, the non-delineated areas have burned numerous times over the past 20 years and generally do not provide suitable sagebrush cover for breeding activities. For example, portions of the NMVLWG breeding habitat map were removed from the map of occupied breeding habitat because these areas were not contiguous with areas of recent known use and sagebrush cover was  $< 5\%$ . These areas may be incidentally used by sage-grouse during the breeding period and could provide adequate breeding habitat in the future; however, they likely do not currently support the local breeding population of sage-grouse.

### *Summer Habitat*

Summer encompasses the late brood-rearing (older chicks) period when the diet of sage-grouse includes insects and forbs in addition to sagebrush. Late brood-rearing for sage-grouse in the Monument typically occurs from June 16 to October 15 [NMV LWG, 2009]. Sage-grouse can occur in a variety of habitat during this time. Hens with broods are often found in mesic habitats such as alfalfa fields, riparian meadows, and grasslands in addition to sagebrush communities [Connelly et al., 2000]. Males can be found at higher elevations, including non-traditional habitats such as non-forested alpine areas [NMVLWG, 2009].

Occupied summer habitats were delineated based largely on the presence of sagebrush, brood-rearing habitat maps, and/or sage-grouse observation data  $\leq 10$  years old (primarily from telemetry studies). Sources used to identify summer use areas included: sage-grouse observations and brood-rearing habitat maps provided by the NMVLWG and the Upper Snake BLM Field Office, observations in land management and wildlife agency files, telemetry data, and vegetation

maps (i.e., existing vegetation, Key habitat, and field data points of  $\geq 5\%$  shrub cover collected utilizing the Sage-grouse Habitat Assessment Framework as described in Stiver et al. (2010)). Specifically, we used GIS to overlay spatial data delineating brood-rearing habitat across the west half of the Monument [NMVLWG, 2009] with known use areas on the east side of the Monument (Upper Snake BLM Field Office, 2014). We combined this data with existing sagebrush communities and areas within 1 mile of verified sage-grouse observations in and adjacent to the Monument. GIS shapefiles of sage-grouse observations were compiled from IDFG telemetry studies (Palmer, 1991-1995; Lowe, 2004-2006; IDFG/BLM, 2012-2014), falconer GPS locations (King, 2000-2008; Skinner, 2007-2008; Greene, 2008), and BLM and other agency observation data (BLM, 1991-2013). Sagebrush and associated vegetation communities contiguous with areas of recent known use (sage-grouse locations  $\leq 10$  years old), which did not have effective barriers to sage-grouse movement from known use areas, were considered occupied unless specific information existed that documented the lack of sage-grouse use [Stiver et al., 2010]. Areas that were not delineated as occupied summer habitat did not contain verified sage-grouse observations. These areas may be incidentally used by sage-grouse during the brood-rearing period and could provide adequate habitat in the future; however, they likely do not currently support the local population of sage-grouse. Approximately 248,900 acres of BLM Monument lands were mapped as occupied summer habitat.

#### *Late Fall-Winter Habitat*

During late fall and winter, sage-grouse are dependent on sagebrush for food and cover. Sagebrush communities exposed above the snow or on wind-swept ridges are used by sage-grouse. Sage-grouse typically congregate in groups and are traditional in their use of wintering areas [Berry & Eng, 1985], although these may vary somewhat based upon weather. The late fall-winter period for sage-grouse in the Monument typically occurs from October 16 to March 14 [NMVLWG, 2009].

The extent of occupied late fall-winter habitat was delineated based largely on the presence of sagebrush and sage-grouse observation data  $\leq 10$  years old (primarily from telemetry studies). Sources used to identify late fall-winter use areas included: sage-grouse observations and late fall-winter habitat maps provided by the NMVLWG, observations in land management and wildlife agency files, telemetry data, and vegetation maps (i.e., existing vegetation, Key habitat, and field data points of  $\geq 5\%$  shrub cover collected utilizing the Sage-grouse Habitat Assessment Framework as described in Stiver et al. (2010)). Specifically, we used GIS to overlay spatial data delineating late fall-winter habitat across the west half of the Monument [NMVLWG, 2009] with sagebrush communities in and adjacent to the Monument. We combined this data with areas within 1 mile of verified sage-grouse observations in and adjacent to the Monument. GIS shapefiles of sage-grouse observations were compiled from IDFG telemetry studies (Palmer, 1991-1995; Lowe, 2004-2006; IDFG/BLM, 2012-2014), falconer GPS locations (King, 2000-2008; Skinner, 2007-2008; Greene, 2008), and BLM and other agency observation data (BLM, 1991-2013). Approximately 204,000 acres of BLM Monument lands were mapped as occupied late fall-winter habitat.

Areas delineated as late fall-winter habitat were comprised largely of sagebrush communities. Perennial and annual grasslands were also included if recent late fall-winter grouse observations ( $\leq 10$  years old) occurred and/or pockets of sagebrush existed. For example, the area north of the Wapi Lava Field is generally mapped as perennial grassland; however, the area contains patches of sagebrush as well as recent late fall-winter observations of sage-grouse. Thus, portions of this area were included in the late fall-winter habitat polygon. Areas containing sage-grouse



observation data  $> 10$  years old remained identified as occupied late fall-winter habitat if sagebrush cover was  $\geq 5\%$ . In addition, sagebrush and associated vegetation communities contiguous with areas of recent known use (sage-grouse locations  $\leq 10$  years old), which did not have effective barriers to sage-grouse movement from known use areas, were considered occupied unless specific information existed that documented the lack of sage-grouse use [Stiver et al., 2010]. Some of the mapped, occupied late fall-winter areas do not currently provide suitable habitat (e.g., [Stiver et al., 2010]) for sage-grouse due to plant structure characteristics, edaphic conditions, slope, aspect, or other factors. However, at the scale of the seasonal home range, these areas likely provide for the life-cycle activities of the local sage-grouse population. Areas that were not delineated as occupied late fall-winter habitat did not contain verified sage-grouse observations. These areas may be incidentally used by sage-grouse during the late fall-winter period and could provide adequate habitat in the future; however, they likely do not currently support the local population of sage-grouse.

# **Appendix H. Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management [USDI BLM, 1997]**

## **Idaho Standards for Rangeland Health**

- **Standard 1 (Watersheds)**

Watersheds provide for the proper infiltration, retention, and release of water appropriate to soil type, vegetation, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

- **Standard 2 (Riparian Areas and Wetlands)**

Riparian-wetland areas are in proper functioning condition appropriate to soil type, climate, geology, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

- **Standard 3 (Stream Channel/Floodplain)**

Stream channels and floodplains are properly functioning relative to the geomorphology (e.g. gradient, size, shape, roughness, confinement, and sinuosity) and climate to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

- **Standard 4 (Native Plant Communities)**

Healthy, productive, and diverse native animal habitat and populations of native plants are maintained or promoted as appropriate to soil type, climate, and landform to provide for proper nutrient cycling, hydrologic cycling, and energy flow.

- **Standard 5 (Seedings)**

Rangelands seeded with mixtures, including predominately non-native plants, are functioning to maintain life form diversity, production, native animal habitat, nutrient cycling, energy flow, and the hydrologic cycle.

- **Standard 6 (Exotic Plant Communities, other than Seedings)**

Exotic plant communities, other than seedings, will meet minimum requirements of soil stability and maintenance of existing native and seeded plants. These communities will be rehabilitated to perennial communities when feasible cost effective methods are developed.

- **Standard 7 (Water Quality)**

Surface and ground water on public lands comply with Idaho Water Quality Standards.

- **Standard 8 (Threatened and Endangered Plants and Animals)**

Habitats are suitable to maintain viable populations of threatened and endangered, sensitive, and other special status species.

## **Guidelines for Livestock Grazing Management**

- Use grazing management practices and/or facilities to maintain or promote significant progress towards adequate amounts of ground cover (determined on an ecological site basis) to support infiltration, maintain soil moisture storage, and stabilize soils.
- Locate livestock management facilities away from riparian areas wherever they conflict with achieving or maintaining riparian-wetland functions.
- Use grazing management practices and/or facilities to maintain or promote soil conditions that support water infiltration, plant vigor, and permeability rates and minimize soil compaction appropriate to site potential.
- Implement grazing management practices that provide periodic rest or deferment during critical growth stages to allow sufficient regrowth to achieve and maintain healthy, proper functioning conditions, including good plant vigor and adequate vegetative cover appropriate to site potential.
- Maintain or promote grazing management practices that provide sufficient residual vegetation to improve, restore, or maintain healthy riparian-wetland functions and structure for energy dissipation, sediment capture, ground water recharge, streambank stability, and wildlife habitat appropriate to site potential.
- The development of springs, seeps, or other projects affecting water and associated resources shall be designed to protect the ecological functions, wildlife habitat, and significant cultural and historical/archaeological/paleontological values associated with the water source.
- Apply grazing management practices to maintain, promote, or progress toward appropriate stream channel and streambank morphology and functions. Adverse impacts due to livestock grazing will be addressed.
- Apply grazing management practices that maintain or promote the interaction of the hydrologic cycle, nutrient cycle, and energy flow that will support the appropriate types and amounts of soil organisms, plants, and animals appropriate to soil type, climate, and landform.
- Apply grazing management practices to maintain adequate plant vigor for seed production, seed dispersal, and seedling survival of desired species relative to soil type, climate, and landform.
- Implement grazing management practices and/or facilities that provide for complying with the Idaho Water Quality Standards.
- Use grazing management practices developed in recovery plans, conservation agreements, and ESA, Section 7 consultations to maintain or improve habitat for federally listed threatened, endangered, and sensitive plants and animals.
- Apply grazing management practices and/or facilities that maintain or promote the physical and biological conditions necessary to sustain native plant populations and wildlife habitats in native plant communities.
- On areas seeded predominantly with non-native plants, use grazing management practices to maintain or promote the physical and biological conditions to achieve healthy rangelands.

- Where native communities exist, the conversion to exotic communities after disturbance will be minimized. Native species are emphasized for rehabilitating disturbed rangelands. Evaluate whether native plants are adapted, available, and able to compete with weeds or seeded exotics.
- Use non-native plant species for rehabilitation only in those situations where:
  1. native species are not readily available in sufficient quantities;
  2. native plant species cannot maintain or achieve the standards; or
  3. non-native plant species provide for management and protection of native rangelands.
- Include a diversity of appropriate grasses, forbs, and shrubs in rehabilitation efforts.
- On burned areas, allow natural regeneration when it is determined that populations of native perennial shrubs, grasses, and forbs are sufficient to revegetate the site. Rest burned or rehabilitated areas to allow recovery or establishment of perennial plant species.
- Carefully consider the effects of new management facilities (e.g., water developments, fences) on healthy and properly functioning rangeland prior to implementation.
- Use grazing management practices, where feasible, for wildlife control and to reduce the spread of targeted undesirable plants (e.g., cheatgrass, medusa head, wild rye, and noxious weeds) while enhancing vigor and abundance of desirable native or seeded species.
- Employ grazing management practices that promote natural forest regeneration and protect reforestation projects until the Idaho Forest Practices Act requirements for timber stand replacement are met.
- Design management fences to minimize adverse impacts, such as habitat fragmentation, to maintain habitat integrity and connectivity for native plants and animals.

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# Appendix I. Socioeconomic Reference and Data Tables

## I.1. Economic Model

The model used in calculating the regional economic effects of changes in permitted range AUMs implements a partial-budgeting, marginal analysis approach to economic analysis of an agricultural enterprise. The model is based on a series of assumptions related to both market conditions and how the affected ranches might respond to changes in AUMs given those conditions, as outlined below.

The AUMs used as the baseline for comparison in the model are taken from current active AUMs listed in the descriptions of the alternatives. AUMs and months of use for each alternative were plugged into the model to evaluate the economic effects of the increase or decrease in AUMs that would occur if a specific alternative were implemented.

In the analysis, it is assumed that the maximum AUMs permitted in any given month on the allotment serve as the limiting factor in determining the maximum size of the herd from which annual production can be obtained. The total supported number of animal units (AUs) is set by the number of range AUMs divided by the number of months on the allotment. In other words, an allotment with 180 permitted AUMs spread over 6 months would be able to support no more than 30 animal units, and the size of the herd is assumed to be constant throughout the year, regardless of how many months the herd grazes on the allotment being evaluated. For the purposes of this analysis, it is assumed that cattle are grazed on the Monument for an average of 7 months each year. For cattle, each animal unit is assumed to be equal to one cow-calf pair. For sheep, each animal unit is assumed to be equal to five ewes, with or without lambs.

Under each alternative, if the total number of AUs decreases it is assumed that the rancher will sell the excess livestock (either internally within the overall ranch operation, or externally at auction) at a sale weight of 1100 pounds and a sale price of \$0.64 per pound for cattle, and at a price of \$7.81 each for sheep. It is also assumed that the rancher will invest or save the proceeds from the sale at a rate of return or interest rate of 2%. Although under current financial market conditions a rancher might be able to realize a much higher rate of return, 2% is a reasonable rate to use under the assumption that ranchers would prefer to put revenue into relatively safe, conservative investments. In the model, the proceeds from selling excess cattle are annualized as a stream of revenue over ten years. This revenue stream is added to the overall net revenue associated with the allotment. The mathematical model includes a provision for evaluating cases in which rather than selling excess animals, a rancher chooses to retain them and feed them elsewhere. Because of limited information and complexities regarding assumptions about the actual business decisions that ranchers might make, this type of case was not included in the completed analyses.

If the total number of AUs increases under an alternative, it is assumed that the rancher will purchase additional cattle under the same conditions as outlined above for excessed cattle. The cost of additional cattle is annualized over ten years as a stream of costs, added to overall operating costs for the allotment.

In the model, it is assumed that ranchers will realize a 90% success rate in taking calves to market. In other words, 90% of cow-calf pairs will result in a calf being sold at the end of the summer

season. Sold animals are equal to total AUs x 0.9. This calculation assumes that bulls are not included in the total number of AUs on range. The model assumes that calf sale weights will average 490 lbs. The market price for calves is an estimate based on recent regional cattle market data and is assumed to be \$2.35, based on samples from various recent prices for feeder steers.<sup>1</sup> This is a somewhat high market price which has likely been caused by drought, blizzard, and other unusual conditions in cattle-producing regions of the U.S.

Returns data for sheep were taken from University of Idaho Extension enterprise budget data. It is assumed that ranchers will realize a 92% success rate in taking lambs to market.

The annual herd maintenance costs used in the model are derived from standard national cost figures for grazing on public land and include veterinary bills, anticipated mortality losses, vaccination supplies, etc.<sup>2</sup> On public land, the standard cost of herd maintenance is estimated at \$18.54 per AUM. The annual cost of moving the herd is also derived from the standard national cost figures for grazing on public land and includes the cost of trailing and/or trucking animals between pastures, allotments, and/or ranch headquarters as well as herding costs. It also includes the value of the rancher's time plus all herding-related wages and expenses. Current typical costs for trucking range from \$2.50 to \$3.00 per mile per truck, regardless of the number of animals in the load. On public land, the standard cost of herd moving is estimated at \$14.69 per AUM.

The grazing permit cost used in the model is \$1.69 per AUM. Expected annual revenue includes proceeds from calf sales and any revenue stream derived from the sale of excess cattle or sheep. Expected annual costs include herd maintenance costs, herd moving costs, and grazing permit costs. The model does not include ranch operations' fixed costs, costs or returns on land investments, or depreciation. The mathematical model provides the ability to include investments in fixed infrastructure on range allotments as part of the overall economic analysis. Infrastructure costs were not, however, included in the completed economic analysis for this document. Total expected annual net revenue in the model equals expected annual revenue minus expected annual costs. Ten-year net revenue equals expected annual net revenue over ten years, discounted at 3% to determine a present value.

<sup>1</sup>Source: [www.cattle.com](http://www.cattle.com), accessed on 11/19/2015.

<sup>2</sup>Source: Grazing Costs: What's the Current Situation? Neil Rimbey and L. Allen Torell, University of Idaho, 2011. <http://web.cals.uidaho.edu/idaohagbiz/files/2013/01/GrazingCost2011.pdf>

	A	B	C	D	E
2			<b>Summary of Results:</b>		
3			<b>Difference in Annual Net Revenue:</b>		<b>-\$77,074</b>
4			<b>Present Value of Difference in Ten-year Net Revenue:</b>		<b>-\$657,459</b>
5					
6		<b>Question #</b>	<b>Instructions:</b> Enter data into the blue cells using the actual or estimated situation of the rancher(s). Good sources of data include federal, state, ranch, or industry statistics, land-grant university enterprise budgets, and published research. Some cells provide instructions. Some blue cells provide drop-down menus. For each of those cells, select the option that is the closest fit for the setting for the analysis. Pink cells will auto-populate based on the answers entered into specific blue cells or in the "Assumptions" tab. The pre-populated data in the pink cells can be over-written without a loss of "results" functionality. Tan cells can be over-written with "rounded" figures if desired, to make the results more realistic in terms of "whole" animals versus decimals.	<b>Existing</b>	<b>Alternative</b>
7		1	How many AUMs are permitted for active use on this land unit?	5023	4018
8		2	What is the starting date for this land unit? (format: mm/dd/yyyy)	3/1/2015	3/1/2015
9		3	What is the ending date for this land unit? (format: mm/dd/yyyy)	9/30/2015	9/30/2015
10		4	What type of livestock or wildlife will be dependent on these AUMs?	Cow, 1200 lb, with calf	Cow, 1200 lb, with calf
			What is the combined cost of lost animals, veterinary services, salt and feed, routine		

**Figure I.1. Sample illustration showing a portion of Excel-based grazing economics marginal impact calculation worksheet. (Full spreadsheet available upon request.)**

## I.2. AUMs and Concept of Cost of Forage

The “cost” of forage on public land is not \$1.69. This is a misconception that is widely shared among people who are unaware of how the grazing fee is determined. It is not a proxy for the value per AUM of public forage. It is actually a means of leveling the economic playing field between those who have access to public grazing and those who don’t within the livestock industry. It is just slightly less expensive to operate on public land when all inputs are taken into consideration. In order to prevent operators who hold public land allotments from enjoying a market advantage over those operators who do not have access to public grazing, a fee (our grazing fee) is calculated and levied to make approximate total costs equal between public and private land operations. The fee is calculated in AUMs for convenience, but it actually has nothing to do, on a direct basis, with the value of an AUM of forage. It’s unfortunate that there is such a widespread misunderstanding about this issue. It leads many people to believe that somehow operators who hold public land allotments are getting a special deal. In reality, other costs are much larger for them than those faced by operators on private pasture.

Please read more about this in the published source by the University of Nebraska-Lincoln Extension, Corn Husker Economics, June 27, 2012. Corn Husker Economics



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## Appendix J. Glossary

<b>Actual Use:</b>	Where, how many, what kind or class of livestock, and how long livestock graze on an allotment, or a portion or pasture of an allotment.
<b>Allotment:</b>	An area of land designated and managed for grazing of livestock (43 CFR 4100.0–5, 2005).
<b>Allotment Management Plan (AMP):</b>	A documented program developed as an activity plan, that focuses on and contains the necessary instructions for the management of livestock grazing on specified public lands to meet resource condition, sustained yield, multiple use, economic and other objectives (43 CFR 4100.0–5, 2005).
<b>Animal Unit Month (AUM):</b>	The amount of forage required to sustain one mature cow or the equivalent (e.g., five sheep or five goats), for a period of one month (43 CFR 4100.0–5, 2005).
<b>Area of Critical Environmental Concern (ACEC):</b>	An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; or other natural systems or processes, or to protect humans from natural hazards.
<b>a’a:</b>	A Hawaiian term for basaltic lava flows that are typically rough and jagged with a clinkery surface.
<b>Biological Soil Crust:</b>	A complex mosaic of mosses, lichens, algae, cyanobacteria, and fungi that occupies the soil surface in arid and semiarid plant communities. These organisms weave through the soil and essentially glue the surface particles together, forming a protective coating against erosive forces.
<b>Breeding Habitat:</b>	Leks and the sagebrush habitat surrounding leks that are collectively used for pre-laying, breeding, nesting, and early brood-rearing, from approximately March through June.
<b>Candidate Species:</b>	Species not protected under the Endangered Species Act but under consideration by the U.S. Fish and Wildlife Service for inclusion on the list of federally threatened or endangered species.
<b>Carbon Sequestration:</b>	The removal and storage of carbon from the atmosphere in carbon sinks (such as oceans, forests or soils) through physical or biological processes, such as photosynthesis.
<b>Climax Vegetation:</b>	The final vegetation community and highest ecological development of a plant community that emerges after a series of successive vegetational stages. The climax community perpetuates itself indefinitely unless disturbed by outside forces.

<b>Cultural Resource:</b>	The fragile and nonrenewable remains of human activity that are found in historic districts, sites, buildings, and artifacts and that are important in past and present human events.
<b>Desired Future Condition:</b>	Used to describe the future condition of resources to meet management objectives. Desired future condition is based on ecological, social, and economic considerations during the land and resource management planning process.
<b>Diversity (Species):</b>	(1) The absolute number of species in a community, species richness; and (2) a measure of the number of species and their relative abundance in a community; low diversity refers to few species or unequal abundance, high diversity to many species, or equal abundance.
<b>Early Brood-Rearing Habitat:</b>	Upland sagebrush sites relatively close to nest sites, typically characterized by high species richness with an abundance of forbs and insects, where sage-grouse hens raise young chicks (<21 days old).
<b>Ecological Succession:</b>	An ecosystem's gradual evolution to a stable state or climax. If through the ability of its populations and elements, an ecosystem can absorb changes, it tends to persist and become stable through time.
<b>Endangered Species:</b>	Any animal or plant species that is in danger of extinction throughout all of a significant portion of its range. These species are listed by the U.S. Fish and Wildlife Service under provisions of the Endangered Species Act.
<b>Environmental Impact Statement (EIS):</b>	A detailed written statement that is required by the National Environmental Policy Act for a proposed major federal action significantly affecting the quality of the human environment. The findings from the document are published in a Record of Decision.
<b>Ethnographic Resource:</b>	A site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.
<b>Exotic Species:</b>	An animal or plant species that is not a part of an area's original fauna or flora.
<b>Fall Habitat:</b>	The matrix of sagebrush habitat areas that sage-grouse slowly move through from September through November, transitioning from summer habitat to winter habitat, and shifting their diet from including large amounts of forbs to feeding exclusively on sagebrush (Connelly et al. 2000).
<b>Fire Suppression:</b>	All work and activities associated with fire extinguishing operations, beginning with the discovery and continuing until the fire is completely extinguished.

<b>Forb:</b>	A broad-leaved plant (herb) whose stem does not produce woody, persistent tissue and generally dies back at the end of each growing season, such as arrowleaf balsamroot.
<b>Functional At-Risk:</b>	A riparian-wetland area that is in functional condition, but has at least one attribute or process that makes it susceptible to degradation.
<b>Government-to-Government Consultation:</b>	The active, affirmative process between agencies of the federal government and tribal governments under the laws of the United States. Tribal governments are considered domestic sovereignties with primary and independent jurisdictions over tribal lands. Consultation consists of: (1) identifying and seeking input from appropriate Native American governing bodies, community groups and individuals; and (2) considering their interests as a necessary and integral part of the decision-making process. The aim of consultation is to involve affected Native Americans in the identification of issues and the definition of the range of acceptable management options.
<b>Grazing Permit:</b>	A document authorizing use of the public lands within an established grazing district. Grazing permits specify all authorized use including livestock grazing, suspended use, and conservation use. Permits specify the total number of AUMs apportioned, the area authorized for grazing use, or both (43 CFR 4100.0–5, 2005).
<b>Habitat Suitability:</b>	The relative appropriateness of a certain ecological area for meeting the life requirements of an organism (i.e., food, shelter, water, space).
<b>Important Wildlife Habitat:</b>	Big game crucial winter range, big game parturition areas, designated critical migration corridors, sage-grouse breeding and nesting areas, raptor concentration areas, and critical fish spawning areas.
<b>Indicator:</b>	Components or attributes of an ecosystem that can be observed and/or measured that provides evidence of the function, productivity, health and/or condition of the ecosystem.
<b>Inholding:</b>	A non-Federal parcel of land that is completely surrounded by Federal land.
<b>Integrated Weed Management (IWM):</b>	A balanced approach to managing resources including the following processes: prevention, inventory, control, monitoring, and reporting. With IWM the actions include preventing weeds from invading; proper identification and knowledge of invasive weed species; inventory, mapping, and monitoring of weed populations and damage. Weed control decisions are based on knowing potential damage, cost of control method, and environmental impact of the weed and control decision; using control strategies that may include a combination of methods to reduce the weed

population to an acceptable level; and, evaluating the effectiveness and effects of management decisions.

<b>Invasive Species:</b>	In this document, the definition for this term is “a plant or animal species (typically non-native) that rapidly spreads into or displaces a desirable native species or community.” [Exception: An “invasive species,” as defined in Executive Order 13112, is a species that is (1) non-native (or alien) to the ecosystem under consideration, and (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can be plants, animals, and other organisms (e.g., microbes)].
<b>Isolated Habitat:</b>	Isolated habitats are a subset of Key habitat that support relatively small sage-grouse populations. Isolated habitats are separated from other Key habitat by developed land or unsuitable habitat, such as farmland, forests, or grassland.
<b>Key Habitats:</b>	Key habitats contain generally large-scale, intact sagebrush steppe areas that provide sage-grouse habitat during some portion of the year.
<b>Kipuka:</b>	< kee’ poo ka > Hawaiian word meaning “key”, or opening such as for a door. A mound of older land, usually covered by vegetation, which is surrounded by a younger lava flow.
<b>Late Brood-Rearing Habitat:</b>	Variety of habitats used by sage-grouse from July through September. Habitats used include, but not limited to, meadows, farmland, riparian areas, dry lakebeds, and sagebrush areas.
<b>Lava Tube:</b>	Subterranean openings that form when the surface of flowing lava congeals forming a crust. Insulated from the cooling air, the lava underneath the solidified crust continues to flow. As the lava eruption ceases, the tube drains, and a large tubular cave may be left.
<b>Lek:</b>	An assembly area where birds, especially sage-grouse, carry on display and courtship behavior.
<b>Lithic Scatter:</b>	Pertaining to or composed of stone tool scatter; a form of an archeological resource.
<b>Litter:</b>	Dead plant or animal material on the soil surface.
<b>Livestock Developments:</b>	See Range Improvements.
<b>Livestock or Kind of Livestock:</b>	Species of domestic livestock-cattle, sheep horses, burros, and goats (43 CFR 4100.0–5, 2005).
<b>Marginal Habitat :</b>	Area supports the species, but survival rates and reproductive success are generally lower by comparison, and the area may or may not have the potential to become suitable in the future (Cooperrider et al. 1986).

**Multiple Use  
Management:**

The definition of multiple use is defined in the Federal Land Policy and Management Act of 1976 as follows: The management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resource or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform with changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historic values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of the uses that will give the greatest economic return or the greatest output.

**National Environmental  
Policy Act of 1969  
(NEPA):**

The federal law that established a national policy for the environment and requires federal agencies to (1) become aware of the environmental ramifications of their proposed actions, (2) fully disclose to the public proposed federal actions and provide a mechanism for public input to federal decision-making, and (3) prepare environmental impact statements for every major action that would significantly affect the quality of the human environment.

**National Register of  
Historic Places (NRHP):**

The official list, established by the National Historic Preservation Act, of the nation's cultural resources worthy of preservation. The national register lists archeological, historic, and architectural properties (districts, sites, buildings, structures, and objects) nominated for their local, state, or national significance by state and federal agencies and approved by the national register staff.

**Native American  
Graves Protection  
and Repatriation Act  
(NAGPRA):**

Requires Federal Agencies to inventory human remains and associated funerary objects in existing federal museum collections and to provide culturally affiliated tribes with the inventory of collections. The act also requires repatriation, on request, to the culturally affiliated tribes.

**Native American Tribe:**

Any indigenous cultural group in the conterminous United States that the Secretary of the Interior recognizes as possessing tribal status, i.e. federally recognized (listed annually in the Federal Register).

**Native Species:**

Plants or animals indigenous to the area.

**Nesting Habitat:**

Area with protective grass and high lateral shrub cover where hens nest, typically under sagebrush shrubs (Connelly et al., 2000).

<b>Nonfunctional :</b>	A riparian-wetland area that clearly does not provide adequate vegetation, landform, or large woody debris to dissipate energies associated with high flow, and thus does not reduce erosion, improve water quality, etc.
<b>Non-habitat:</b>	Area within the historical distribution of sage-grouse that is unoccupied, does not currently provide habitat, and does not have the potential to provide habitat in the foreseeable future (<100 years).
<b>Noxious Weeds:</b>	According to the Federal Noxious Weed Act (Public Law 93-629), a weed that causes adverse effects on humans and their environment and is therefore detrimental to public health and the agriculture and commerce of the United States.
<b>Occupied Habitat (Greater Sage-Grouse) :</b>	All sagebrush and associated plant communities known to be used by sage-grouse within the last 10 years. Sagebrush areas contiguous with areas of known use, which do not have effective barriers to sage-grouse movement from known use areas, are considered occupied unless specific information exists that documents the lack of sage-grouse use (Stiver et. al., 2010).
<b>Pahoehoe:</b>	A Hawaiian term for a basaltic lava flow that has a smooth, billowy, or ropy surface.
<b>Perennial Stream:</b>	A stream that flows continuously. Perennial streams generally are associated with a water table in the localities through which they flow.
<b>Permitted Use:</b>	The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and is expressed in AUMs (43 CFR 4100.0–5, 2005).
<b>Permittee:</b>	A person or organization legally permitted to graze a specific number and class of livestock on designated areas of public land during specified seasons each year.
<b>Pictograph:</b>	Aboriginally painted designs on natural rock surfaces.
<b>Pioneer Plants:</b>	Plants that establish themselves first on disturbed areas or bare soil.
<b>Playa:</b>	An area of flat, dried-up land, especially a desert basin from which water evaporates quickly.
<b>Pleistocene Age:</b>	The latest major geological epoch from 11,000 to 2 million years ago, the time of human evolution. Also known as the “Ice Age” due to the multiple expansion and retreat of glaciers.
<b>Population :</b>	A collection of organisms of the same species that freely share genetic material (i.e., breed).

<b>Potential Habitat :</b>	Area is currently unoccupied, but has the potential for occupancy in the foreseeable future (<100 years), through succession or restoration.
<b>Prescribed Fire:</b>	A wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan for which NEPA requirements (where applicable) have been met prior to ignition.
<b>Proper Functioning Condition (PFC) :</b>	A riparian-wetland area in which adequate vegetation or other structure components are present to dissipate energy, reduce erosion and improve water quality, filter sediment and aid in floodplain development, improve flood-water retention and ground-water recharge, stabilize streambanks and shorelines, develop diverse ponding and channel characteristics for fish and wildlife habitat among other things, and support greater biodiversity.
<b>Public Land:</b>	Any land or interest in land owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except for (1) land located on the Outer Continental Shelf and (2) land held for the benefit of American Indians, Aleuts, and Eskimos.
<b>Range Improvements:</b>	An authorized physical modification or treatment which is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; restore, protect, and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and wildlife. The term includes, but is not limited to structures, treatment projects, and use of mechanical devices or modifications achieved through mechanical means (43 CFR 4100.0–5, 2005).
<b>Rangeland:</b>	Land on which the potential natural vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundra, and areas that support certain forb and shrub communities.
<b>Raptor:</b>	Bird of prey with sharp talons and a strongly curved beak, such as hawks, falcons, owls, vultures, and eagles.
<b>Record of Decision (ROD):</b>	A document signed by a responsible official recording a decision that was preceded by the preparation of an environment impact statement.
<b>Reference State:</b>	The state where the functional capacities represented by soil/site stability, hydrologic function, and biotic integrity are performing at an optimum level under the natural disturbance regime. This state usually includes, but is not limited to, what is often referred to as the potential natural plant community (NTT, 2011).



**Restoration Habitats  
(R1, R2, and R3):**

Restoration habitats have the potential to provide sage-grouse habitat in the future. These are sagebrush steppe areas that have been converted to grassland or woodland or are in the successional process of converting to woodland. These areas are located in close proximity to Key or Source habitats. Data indicate that sage-grouse historically occupied these areas and may still utilize some sporadically, such as during migrations. Restoration habitats have a high likelihood of being reoccupied if habitat suitability improves. Specifically, R1 lands are sagebrush-limited areas with acceptable understory conditions in terms of grass species composition. R2 lands are areas dominated or strongly influenced by invasive annuals such as cheatgrass, medusahead rye, or similar species. Areas with sagebrush may or may not be present, but in general, understories are not suitable for sage-grouse. R3 lands are areas where junipers and/or other conifers are encroaching into sage-grouse habitat areas.

**Rift Zone:**

Area characterized by an open volcanic fissure.

**Right-of-Way (ROW):**

A permit or an easement that authorizes the use of public land for certain specified purposes, commonly for pipelines, roads, telephone lines, electric lines, and reservoirs. It is also the reference to the land covered by such an easement or permit.

**Riparian Areas:**

An area that is saturated or inundated at a frequency and duration sufficient to produce vegetation typically adapted for life in saturated soil conditions.

**Sacred Site:**

Any specific, discrete, narrowly delineated location on federal land that is identified by a Native American tribe, or Native American individual determined to be appropriately authoritative representative of a Native American religion, as sacred by virtue of its established religious significance to, or ceremonial use by, a Native American religion.

**Sagebrush Obligates:**

Species restricted to sagebrush habitats during the breeding season or year round.

**Sagebrush Steppe  
Community:**

A semi-arid plant community that is characterized by a predominance of big sagebrush and other sagebrush species, plus grasses and forbs.

**Section 106  
Consultation:**

Also known as the 36 CFR 800 process. Discussions between a federal agency official and the Advisory Council on Historic Preservation, State Historic Preservation Officer, and other interested parties concerning historic properties that could be affected by a specific undertaking. Section 106 is the portion of the National Historic Preservation Act that outlines the procedure. The procedure is codified in 36 CFR 800.

<b>Section 110:</b>	The section of the National Historic Preservation Act that requires federal agencies to complete cultural resources surveys and reports for all its lands and existing projects.
<b>Sensitive Species:</b>	Species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as Bureau sensitive by the State Director(s). All Federal candidate species, proposed species, and delisted species in the 5 years following delisting will be conserved as Bureau sensitive species.
<b>Source Habitat:</b>	Source habitats are a subset of Key habitat that support concentrated sage-grouse populations. Source habitats are also commonly referred to as population strongholds. Data indicate that sage-grouse populations in Source habitats have been generally stable or increasing since the drought of the early 1990s.
<b>Special Status Species:</b>	Wildlife and plant species that are either federally listed as threatened or endangered, proposed threatened or endangered, candidate species, state-listed as threatened or endangered, listed by a Bureau of Land Management State Director as sensitive or determined priority, or listed by the U.S. Fish and Wildlife Service as a focal species or bird species of conservation concern.
<b>State and Transition Models:</b>	State and transition models are a component of Ecological Site Descriptions available from the NRCS. These include a departure from the reference plant community described for each ecological site, and vary depending on past disturbance and vegetation responses. States include continuous and reversible vegetation dynamics, while “discontinuous and nonreversible dynamics occur when thresholds are surpassed and one stable state replaces another.” (Briske, Fuhlendorf, & Smeins, 2005)
<b>Subpopulation:</b>	A portion of a population in a specific geographic location.
<b>Successional Stage:</b>	A stage of development of a plant community with another. Conditions of the prior plant community (or successional stage) create conditions that are favorable for the establishment of the next stage.
<b>Suitable Habitat:</b>	Area provides environmental conditions necessary for successful survival and reproduction to sustain stable populations (Cooperrider et al. 1986, Morrison et al. 1998).
<b>Summer Habitat:</b>	The summer or late brood-rearing period from July through August, when hens and chicks use a variety of moist and mesic habitats where succulent forbs and insects are found in close proximity to sagebrush (Connelly et al. 2000).

<b>Threatened and Endangered Species:</b>	As defined in the Endangered Species Act of 1973, as amended (Public Law 93-205; 87 Stat. 884), an endangered species means “any species which is in danger of extinction throughout all or a significant portion of its range” and threatened species means “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” Whether a species is threatened or endangered is determined by the following factors: (1) present or threatened destruction, modification, or curtailment of its habitat or range; (2) over-utilization for commercial, sporting, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors.
<b>Traditional Cultural Properties:</b>	A cultural property that is eligible for inclusion in the National Register of Historic Places because of its association with a living community’s cultural practices or beliefs that (a) are rooted in that community’s history and (b) are important in maintaining the community’s continuing cultural identity.
<b>Traditional Lifeway Values:</b>	Values that are important for maintaining a group’s traditional system of religious belief, cultural practice, or social interaction.
<b>Treaty:</b>	A formal agreement between the United States and one or more Native American tribes. Typically, these arrangements ceded lands to the United States, reserving certain rights, privileges, and/or lands to the Native American signatories.
<b>Trust Responsibility (also referred to as fiduciary responsibility):</b>	The trust responsibility of the United States, executed through the Secretary of the Interior, to uphold obligations of the federal government to federally recognized Native American tribes.
<b>Understory:</b>	Herbaceous plant components, including grasses and forbs, which grow beneath the overstory in a stand of woody shrubs; or the herbaceous and woody shrubs growing beneath the overstory in a stand of trees.
<b>Unsuitable Habitat:</b>	Area does not currently provide one or more of the life requisites, and therefore does not provide habitat, but may provide habitat some time in the foreseeable future (<100 years), through succession or restoration.
<b>Upland Habitat:</b>	An area that is not inundated with water and typically supports vegetation types adapted to life in non-saturated soil conditions.
<b>Utilization:</b>	The proportion or degree of the current year’s forage production that is consumed or destroyed by animals (including insects). The term may refer either to a single plant species, a group of species, or to the vegetation community as a whole..
<b>Valid Existing Rights:</b>	Locatable mineral development rights that existed when the Federal Land Policy and Management Act (FLPMA) was enacted on

October 21, 1976. Some areas are segregated from entry and location under the Mining Law to protect certain values or allow certain uses. Mining claims that existed as of the effective date of the segregation may still be valid if they can meet the test of discovery of a valuable mineral required under the Mining Law. Determining the validity of mining claims located in segregated lands requires the Bureau of Land Management to conduct a validity examination and is called a “valid existing right” determination.

- Way:** A road-like feature created and used by vehicles having four or more wheels, but not declared a road by the owner and that receives no maintenance to guarantee regular and continuous use.
- Wetland:** Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and which under normal circumstances support a prevalence of vegetation typically adapted for life in saturated soil conditions.
- Wilderness Area:** An area of federal land designated by the United States Congress and defined by the Wilderness Act of 1964 as a place “where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” Designation is aimed at ensuring that these lands are preserved and protected in their natural condition. Wilderness areas, which are generally at least 5,000 acres or more in size, offer outstanding opportunities for solitude or a primitive and unconfined type of recreation; such areas may also contain ecological, geological, or other features that have scientific, scenic, or historical value.
- Wilderness Inventory:** A written description of resource information and accompanying map of those public lands that meet the wilderness criteria as established under Section 603(a) of the Federal Land Policy and Management Act and Section 2(c) of the Wilderness Act.
- Wilderness Study Area (WSA):** An area designated by a federal agency as having wilderness characteristics, thus making it worthy of consideration by Congress for wilderness designation.
- Wildfire:** Unplanned ignition of a wildland fire (such as a fire caused by lightning, volcanoes, unauthorized and accidental human-caused fires) and escaped prescribed fires.
- Wildland Fire Use:** A naturally ignited fire allowed to burn under designated conditions to meet resource management objectives.
- Winter Habitat:** Sagebrush habitats that provide access to sagebrush above the snow for all food and cover requisite needs (Connelly et al. 2000).
- Withdrawal:** Removal or “withholding” of public lands from operation of some or all of the public land laws (settlement, sale, mining, and or mineral leasing). An action that restricts the use or disposal of

public lands, segregating the land from the operation of some or all of the public land and/or mineral laws and holding it for a specific public purpose. Withdrawals may also be used to transfer jurisdiction of management to other federal agencies

## Appendix K. Abbreviations and Acronyms

<b>ACEC:</b>	Area of Critical Environmental Concern
<b>AMP:</b>	Allotment Management Plan
<b>ARMPA:</b>	Approved Resource Management Plan Amendment
<b>ATV:</b>	All Terrain Vehicle
<b>AUM:</b>	Animal Unit Month
<b>BLM:</b>	Bureau of Land Management
<b>BMP:</b>	Best Management Practice
<b>BSU:</b>	Biologically Significant Unit
<b>CEQ:</b>	Council on Environmental Quality
<b>CFR:</b>	Code of Federal Regulation
<b>CHHR:</b>	Core Herd Home Range
<b>CRMP:</b>	Cultural Resource Management Plan
<b>DFC:</b>	Desired Future Condition
<b>EA:</b>	Environmental Assessment
<b>EIS:</b>	Environmental Impact Statement
<b>EPA:</b>	Environmental Protection Agency
<b>ERMA:</b>	Extensive Recreation Management Area
<b>ES &amp; BAR:</b>	Emergency Stabilization and Burned Area Rehabilitation
<b>ESA:</b>	Endangered Species Act
<b>ESD:</b>	Ecological Site Description
<b>FEIS:</b>	Final Environmental Impact Statement
<b>FLPMA:</b>	Federal Land Policy and Management Act
<b>FMDA:</b>	Fire Management Direction Amendment
<b>FMP:</b>	Fire Management Plan
<b>FY:</b>	fiscal year
<b>GHG:</b>	Greenhouse Gas
<b>GHMA:</b>	General Habitat Management Area

<b>GIS:</b>	Geographic Information System
<b>GPS:</b>	Global Positioning System
<b>GRSG:</b>	Greater Sage-Grouse
<b>IDEQ:</b>	Idaho Department of Environmental Quality
<b>IDFG:</b>	Idaho Department of Fish and Game
<b>IDL:</b>	Idaho Department of Lands
<b>IDPR:</b>	Idaho Department of Parks and Recreation
<b>IHMA:</b>	Important Habitat Management Area
<b>IMP:</b>	Interim Management Policy
<b>INHP:</b>	Idaho Natural Heritage Program
<b>LHA:</b>	Land Health Assessment
<b>MBTA:</b>	Migratory Bird Treaty Act
<b>MMP:</b>	Monument Management Plan
<b>Monument:</b>	Craters of the Moon National Monument and Preserve
<b>MOU:</b>	Memorandum of Understanding
<b>NAGPRA:</b>	Native American Graves Protection and Repatriation Act
<b>NEPA:</b>	National Environmental Policy Act
<b>NHPA:</b>	National Historic Preservation Act
<b>NMVLWG:</b>	North Magic Valley Local Working Group
<b>NOI:</b>	Notice of Intent
<b>NPA:</b>	National Programmatic Agreement
<b>NPS:</b>	National Park Service
<b>NRCS:</b>	National Resource Conservation Service
<b>NWI:</b>	National Wetlands Inventory
<b>NWIPS:</b>	Noxious Weed and Invasive Plant Species
<b>OHV:</b>	Off Highway Vehicle
<b>PESRP:</b>	Programmatic Emergency Stabilization and Rehabilitation Plan
<b>PFC:</b>	Proper Functioning Condition
<b>PHMA:</b>	Priority Habitat Management Area

<b>PILT:</b>	Payment in Lieu of Taxes
<b>R&amp;VS:</b>	Recreation and Visitor Services
<b>RAC:</b>	Resource Advisory Council
<b>RMP:</b>	Resource Management Plan
<b>ROW:</b>	Right-of-way
<b>RV:</b>	Recreational Vehicle
<b>SFA:</b>	Sagebrush Focal Area
<b>SHPO:</b>	State Historic Preservation Office
<b>SPA:</b>	State Protocol Agreement
<b>SRMA:</b>	Special Recreation Management Area
<b>TFD:</b>	Twin Falls District
<b>US:</b>	United States
<b>USC:</b>	United States Code
<b>USDA:</b>	United States Department of Agriculture
<b>USDI:</b>	United States Department of the Interior
<b>USFWS:</b>	United States Fish and Wildlife Service
<b>USGS:</b>	United States Geological Survey
<b>VRM:</b>	Visual Resource Management
<b>WAFWA:</b>	Western Association of Fish and Wildlife Agencies
<b>WNv:</b>	West Nile virus
<b>WSA:</b>	Wilderness Study Area